0000007332

Jana Van Ness
Manager
Regulatory Compliance

Tel 602/250-2310
Fax 602/250-3399
e-mail:jvanness@apsc.com
http://www.apsc.com

Mail Station 9905
P.O. Box 53999
Phoenix, AZ 85072-3999

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AZ CORP COMMISSION
DOCUMENT CONTROL

January 31, 2003

Mr. Ernest Johnson
Director, Utilities Division
Arizona Corporation Commission
1200 West Washington
Phoenix, Arizona 85007

RE: DOCKET NO. E-00000D-03-0047 A.R.S. 40-360.02
ARIZONA PUBLIC SERVICE COMPANY'S TEN-YEAR PLAN

Dear Mr. Johnson:

Pursuant to the Arizona Revised Statutes, Section 40-360.02 relating to transmission line siting requirements, attached is Arizona Public Service Company's Ten-Year Plan for the period of 2003 through 2012, for construction of new electric facilities. In addition, pursuant to Decision No. 65154, Arizona Public Service Company is also filing their Reliability Must-Run Generation study report in concert with their January 31 Ten-Year Plan.

If you have any questions regarding this filing, please call me at (602)250-2310.

Sincerely,

Jana Van Ness

Jana Van Ness
Manager
Regulatory Compliance

Attachment

JVN/vld

Cc: Patrick Williams, ACC
Manager, Compliance & Enforcement w/o attachment

Docket Control, Original plus 13 copies

Arizona Corporation Commission
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ARIZONA PUBLIC SERVICE COMPANY
2003–2012
TEN-YEAR PLAN

Prepared for the

Arizona Corporation Commission

January 2003

ARIZONA PUBLIC SERVICE COMPANY
2003 - 2012
TEN-YEAR PLAN

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ARIZONA PUBLIC SERVICE COMPANY
2003–2012
TEN-YEAR PLAN

GENERAL INFORMATION

Pursuant to A.R.S. § 40-360.02, Arizona Public Service Company ("APS") submits its 2003-2012 Ten-Year Plan. Additionally, pursuant to Arizona Corporation Commission ("Commission") Decision No. 63876 (July 25, 2001) concerning the first Biennial Transmission Assessment, APS is including with this filing its Transmission Planning Process and Guidelines and maps showing system ratings on APS' transmission system. The Transmission Planning Process and Guidelines outline generally APS' internal planning for its high voltage and extra-high voltage transmission system, including a discussion of APS' planning methodology, planning assumptions, and its guidelines for system performance. The system ratings maps show emergency and continuous system ratings on APS' extra-high voltage system, and on its Metro, Northern and Southern 230 kV systems.

This 2003–2012 Ten-Year Plan describes planned transmission lines of 115 kV or higher voltage that APS may construct over the next ten-year period. Pursuant to A.R.S. § 40-360(10), underground facilities are not included. Also, previously reported facilities that have been completed, canceled, or deferred beyond the upcoming ten-year period are not included. This Ten-Year Plan is tentative information only, and pursuant to A.R.S. § 40-360.02(F), is subject to change, at the discretion of APS, without notice based on land usage, growth pattern changes, regulatory or legal developments, or for other reasons.

For the convenience of the reader, APS has included system maps showing the general location and in-service date for all overhead transmission lines planned by APS for the Arizona and Phoenix Metropolitan Area. Written descriptions of each proposed transmission line are provided on subsequent pages in the currently expected chronological order of each project. The

line routings shown on the system maps and the descriptions of each transmission line are intended to be general and are subject to revision. Specific routing is determined by the Arizona Power Plant and Transmission Line Siting Committee when issuing a Certificate of Environmental Compatibility, and through subsequent right-of-way acquisition. Pursuant to the amendments to A.R.S. § 40-360.02, this filing also includes technical study results for the projects identified. The technical study results show project needs which are generally based on either security (contingency performance) or adequacy (generator interconnection or increasing transfer capability) or both.

APS believes that the projects identified in this 2003-2012 Ten-Year Plan, with their associated in-service dates, will help ensure that APS' transmission system meets all applicable reliability criteria. However, changes in underlying assumptions such as load forecasts, generation expansion, and other utilities' plans, may substantially impact this Ten-Year Plan and could result in changes to anticipated in-service dates or project scopes. Additionally, the future formation and role of the WestConnect Regional Transmission Organization (RTO) may impact this Ten-Year Plan and the transmission planning process generally.

Central Arizona Transmission System (CATS) Study

SRP has included a discussion of CATS in their Ten-Year Plan filing. An excerpt from that discussion is below:

Phase I of the CATS Study served as a screening process that evaluated a large group of transmission alternatives in Central Arizona. This work was used to narrow down the transmission options that merited further evaluation in the second phase of the Study. The results of the CATS Phase I study were used to develop a long-range EHV transmission system for Central Arizona.

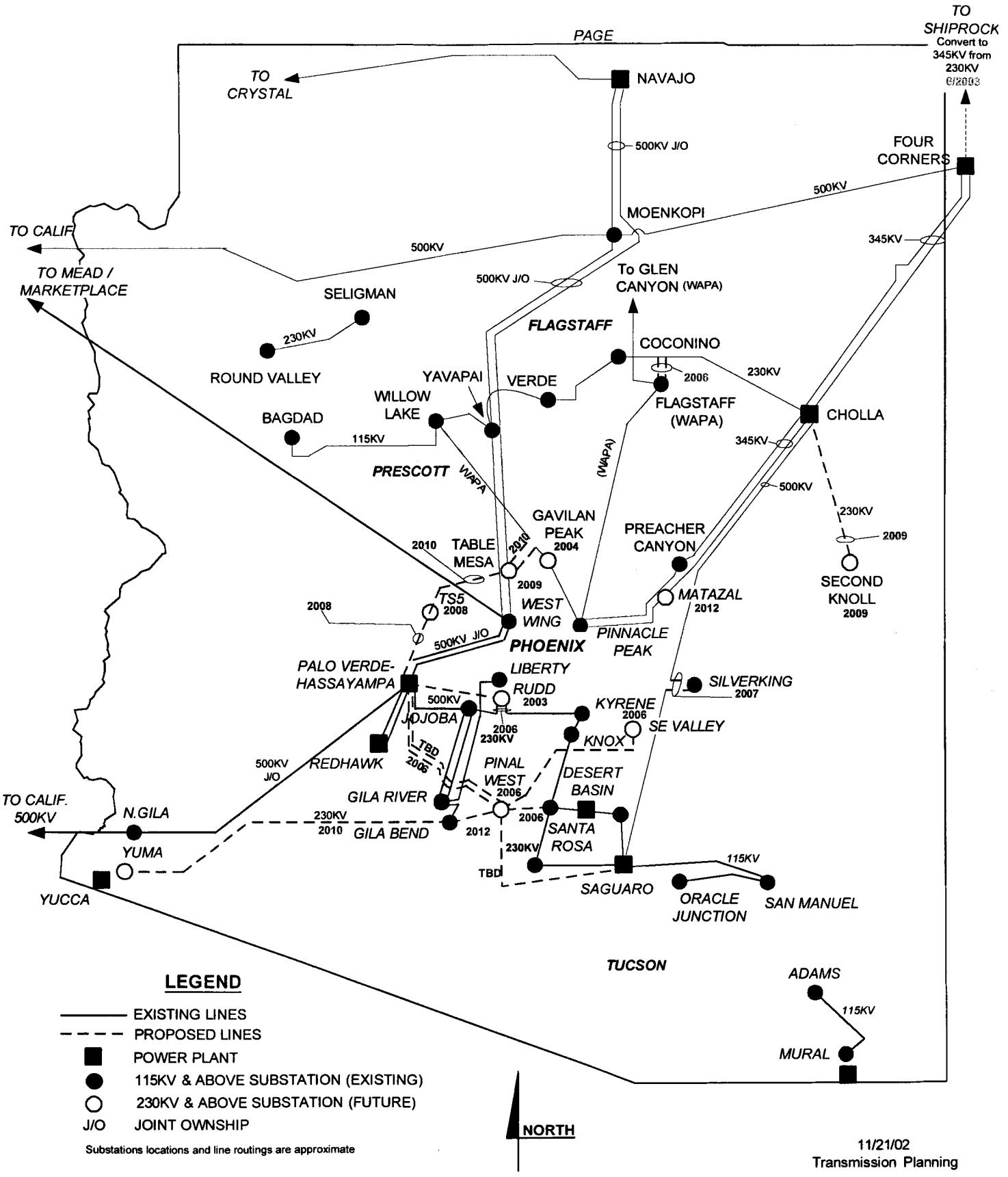
Phase II of the CATS Study took a high-level long-range look at the performance of the CATS EHV transmission system and compared several transmission alternatives to this base EHV system. It is important to note, because of the nature of the CATS Phase I and Phase II studies, only a comparative analysis of the transmission alternatives were performed. Consequently the study did not represent a specific time frame.

The CATS Phase III study will be a collaborative regional study for Central Arizona for the 2012 time frame.

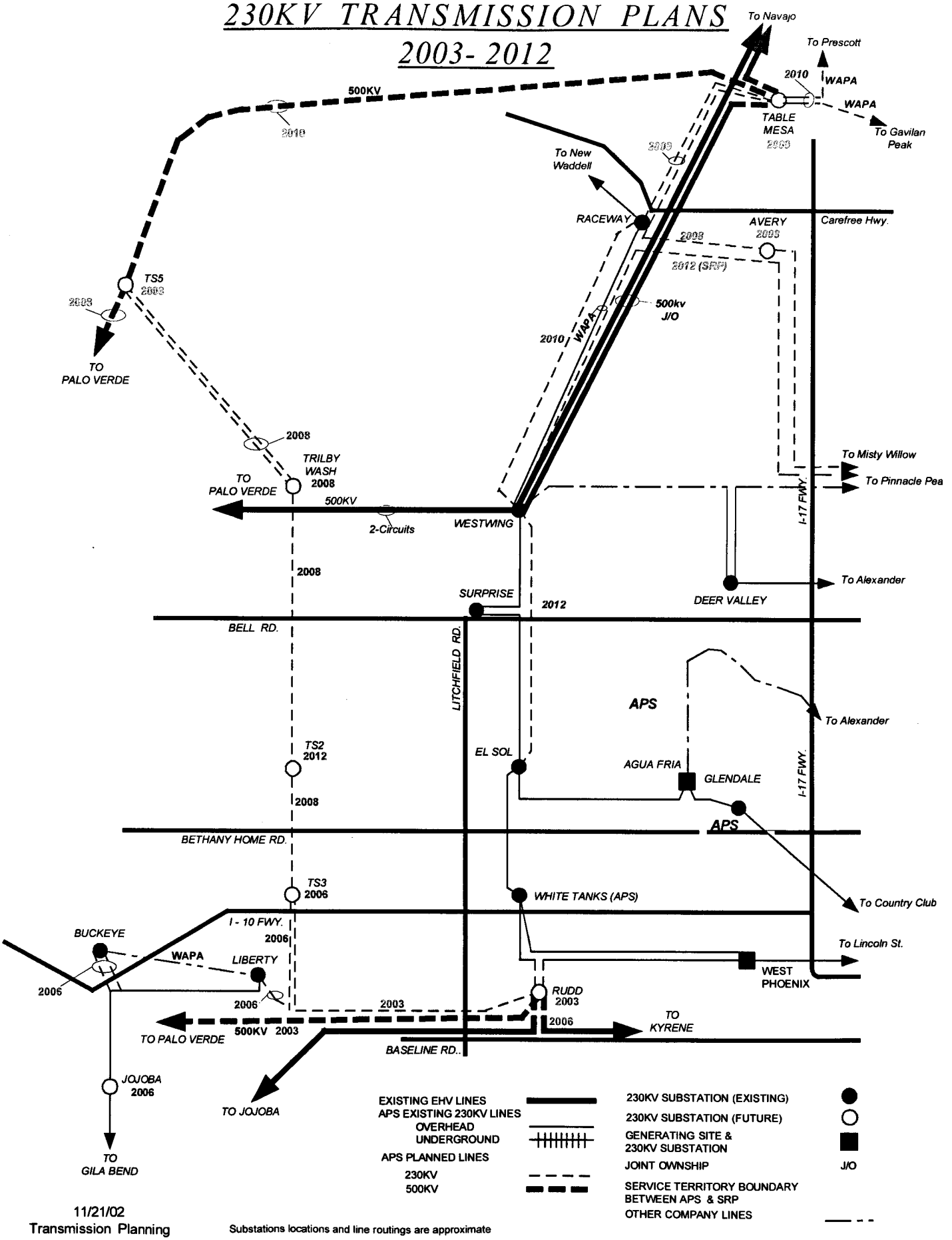
Since last year's submission Salt River Project, in conjunction with APS, Santa Cruz Electric and Water Districts, and Tucson Electric Power, have embarked upon the Palo Verde – Southeast Valley Station 500kV line and attendant intermediate stations. The project is structured to bring power from the Palo Verde hub to the Casa Grande/Coolidge/Eloy/Florence areas as well as to SRP's service territory in Pinal County north of Florence. SRP is leading an environmental effort to site the facilities associated with this project. Current projections are to submit applications for Certificates of Environmental Compatibility in early to mid 2003.

Subsequent to the completion of Phase I of the CATS study, several of the participating utilities and other market participants embarked upon studies to define the underlying systems necessary to efficiently and effectively integrate their existing systems into the CATS plan. This study work is being coordinated by the Arizona Power Authority and is on going.

APS EHV & OUTER DIVISION 115/230 KV TRANSMISSION PLANS 2003 - 2012



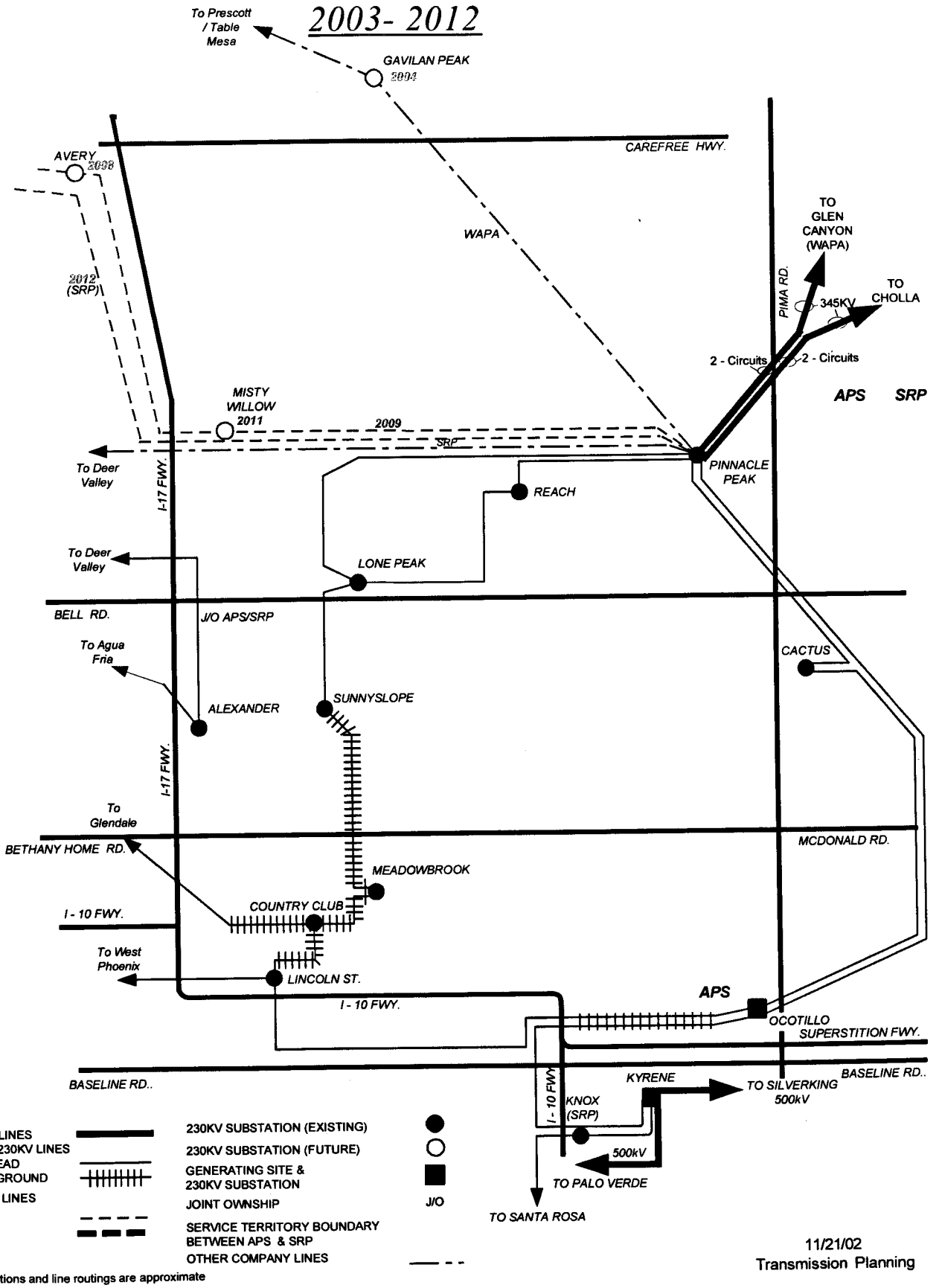
PHOENIX METROPOLITAN (WEST) AREA
230KV TRANSMISSION PLANS
2003- 2012



11/21/02
Transmission Planning

Substations locations and line routings are approximate

PHOENIX METROPOLITAN (EAST) AREA
230KV TRANSMISSION PLANS
2003- 2012



Substations locations and line routings are approximate

Arizona Public Service Company
2003 —2012
Ten-Year Plan

Planned Transmission Description
2003

Line Designation	Palo Verde-Rudd 500kV Line.
Size	
(a) Voltage	525 kV AC.
(b) Capacity	2728 MVA.
(c) Point of Origin	Palo Verde Power Plant; Sec. 34, TIN, R6W.
(d) Intermediate Point	None.
(e) Point of Termination	Rudd 500/230-kV substation to be constructed near the intersection of Broadway Road and 119th Avenue; within the southwest quarter of Sec. 24, TIN, R1W. West Phoenix-White Tanks 230kV line will be looped in and out of Rudd.
(f) Length	Approximately 36 miles of single-circuit line.
Routing	Northeast of Palo Verde, paralleling the PV-Westwing lines to the north side of Interstate 10, then east to approximately Miller Road where it will cross to the south side of Interstate 10. The line will then parallel existing transmission lines in an easterly direction to the new substation.
Purpose	This single-circuit 500-kV line, along with the associated Rudd substation, will provide a needed bulk power source for the rapidly growing southwestern (SW) Phoenix area, thus supplementing existing bulk power sources in the metropolitan area at Westwing (NW) Pinnacle Peak (NE) and Kyrene (SE). The Palo Verde-Rudd 500-kV line will relieve demand upon heavily loaded facilities at the three other bulk power sources. Furthermore, the Palo Verde-Rudd 500-kV line will improve the balance of power flows throughout the Phoenix Metropolitan transmission system and decrease electrical losses, while increasing power import capability, system reliability, and service quality for customers.
Date	
(a) Construction Start	2002
(b) Estimated In Service	2003

Certificate of Environmental Compatibility issued 2/12/02 (Case No. 115, Decision No. 64473). Revised on 4/9/02, Decision No. 64704.

Arizona Public Service Company
2003 —2012
Ten-Year Plan

Planned Transmission Description
2004

Line Designation	Gavilan Peak loop-in of Pinnacle Peak-Prescott 230-kV line.
Size	
(a) Voltage	230-kV AC.
(b) Capacity	To be determined.
(c) Point of Origin	Pinnacle Peak-Prescott 230-kV line near 12th Street and Desert Hills Drive; Sec. 28, T6N, R3E.
(d) Intermediate Point	None.
(e) Point of Termination	Gavilan Peak 230/69-kV substation to be built in 2004, 1/4 mile south of the intersection of 12th Street and Desert Hills Drive; within the northeast quarter of Sec. 28, T6N, R3E.
(f) Length	Approximately 1 span each of two single-circuit lines.
Routing	Gavilan Peak 230-kV substation will be adjacent to the Pinnacle Peak-Prescott 230-kV line so it will just be one or two spans.
Purpose	This substation will be needed to serve projected need for electric energy in the area immediately north of the Phoenix Metropolitan area. Additionally, improved reliability and continuity of service will result for the growing communities in the areas of Desert Hills, Anthem, and New River.
Date	
(a) Construction Start	2003
(b) Estimated In Service	2004

Certificate of Environmental Compatibility is not needed for this project.

Arizona Public Service Company
2003 —2012
Ten-Year Plan

Planned Transmission Description
2006

Line Designation	Rudd loop-in of Jojoba-Kyrene 500-kV line.
Size	
(a) Voltage	525-kV AC.
(b) Capacity	2728 MVA each.
(c) Point of Origin	Jojoba-Kyrene 500-kV line near 119th Avenue and Broadway Road; Sec. 25, T1N, R1W.
(d) Intermediate Point	None.
(e) Point of Termination	Rudd substation, near the intersection of Broadway Road and 119th Avenue; within the southwest quarter of Sec. 24, T1N, R1W.
(f) Length	Approximately .5 miles each of two single-circuit lines.
Routing	North from the Jojoba-Kyrene 500-kV line near 119th Avenue, paralleling existing transmission lines to the Rudd substation.
Purpose	These two single-circuit 500-kV lines may provide an increase in import capability to the Phoenix Metropolitan area as well as reduce the exposure for loss of the 500-kV line serving Kyrene from the Palo Verde area by approximately 50%.
Date	
(a) Construction Start	2006
(b) Estimated In Service	2006

Certificate of Environmental Compatibility issued 2/12/02 (Case No. 115, Decision No. 64473). Revised on 4/9/02, Decision No. 64704.

Arizona Public Service Company
2003 —2012
Ten-Year Plan

Planned Transmission Description
2006

Line Designation	Rudd – TS3 – Liberty 230-kV line.
Size	
(a) Voltage	230-kV AC.
(b) Capacity	1200 MVA.
(c) Point of Origin	Rudd substation, near the intersection of Broadway Road and 119th Avenue; within the southwest quarter of Sec. 24, T1N, R1W.
(d) Intermediate Point	TS3 230/69-kV substation to be constructed in 2006 approximately 10 miles west of White Tanks substation; Sec. 35, T2N, R2W.
(e) Point of Termination	The WAPA Liberty substation, Sec. 19, T1N, R2W, or a new 230-kV substation, TS4 located just south of the WAPA Liberty substation.
(f) Length	Approximately 19 miles of single-circuit 230kV.
Routing	West from the Rudd substation for approximately 6 miles, on the same poles as the Palo Verde-Rudd 500-kV line. Then north approximately 4 miles, then returning south, to and from the TS3 substation. Then west approximately 5 miles to the Liberty substation, on the same poles as the Palo Verde-Rudd 500-kV line.
Purpose	This 230-kV line will provide a source for the TS3 230/69-kV substation and 69-kV substations planned in the western and southwestern Phoenix Metropolitan area. Increased reliability and quality of service will result for customers served by the 230/69-kV substation.
Date	
(a) Construction Start	2002 (The component that was already certificated in Case No. 115, Decision No. 64473 will have construction started in 2002.)
(b) Estimated In Service	2006

Certificate of Environmental Compatibility issued 2/12/02 (Case No. 115, Decision No. 64473). Revised on 4/9/02, Decision No. 64704. This CEC is for the 230-kV component running east and west on the same poles as the Palo Verde-Rudd 500-kV line. A Certificate of Environmental Compatibility for the 8 miles of 230-kV line running north and south will be filed as part of the West Valley South project in 2003.

Arizona Public Service Company
2003 —2012
Ten-Year Plan

Planned Transmission Description
2006

Line Designation	Buckeye loop-in of Liberty-Gila Bend 230-kV line.
Size	
(a) Voltage	230-kV AC.
(b) Capacity	To be determined.
(c) Point of Origin	Liberty-Gila Bend 230-kV line near Rooks Road and Lower Buckeye Road; Sec. 07, T1N, R3W.
(d) Intermediate Point	None.
(e) Point of Termination	Buckeye substation; Sec. 07, T1N, R3W.
(f) Length	Approximately 1 mile each of two single-circuit lines.
Routing	North from the Liberty-Gila Bend 230-kV line near Rooks Road and Lower Buckeye Road, to the Buckeye substation.
Purpose	This project will be needed to improve the reliability and continuity of service to serve projected need for electric energy for the growing communities in the area around Buckeye.
Date	
(a) Construction Start	2006
(b) Estimated In Service	2006

An application for the Certificate of Environmental Compatibility is planned for 2003. This project will be part of the West Valley South project in 2003.

Arizona Public Service Company
2003—2012
Ten-Year Plan

Planned Transmission Description
2006

Line Designation	Flagstaff loop-in of Cholla-Coconino 230-kV line.
Size	
(a) Voltage	230-kV AC.
(b) Capacity	To be determined.
(c) Point of Origin	Flagstaff 345-kV switchyard owned by WAPA; Sec 24, T21N, R9E.
(d) Intermediate Point	None.
(e) Point of Termination	The Cholla-Coconino 230-kV line approximately 5 miles north of the Flagstaff substation; Sec. 26, T22N, R9E.
(f) Length	Approximately 5 miles of double-circuit line.
Routing	North from the WAPA owned Flagstaff 345-kV substation, via a 345/230-kV transformer, paralleling existing transmission lines, to the point where the Cholla-Coconino 230-kV line crosses the Glen Canyon-Flagstaff 345-kV lines.
Purpose	These lines will serve projected needs for electric energy in the northern Arizona area as well as increase reliability in the region.
Date	
(a) Construction Start	2005
(b) Estimated In Service	2006

This project was previously identified as the Flagstaff-Winona project. An application for a Certificate of Environmental Compatibility has not yet been filed.

Arizona Public Service Company
2003 —2012
Ten-Year Plan

Planned Transmission Description
2006

Line Designation	Hassayampa-Pinal West-S.E. Valley 500-kV line.
Size	
(a) Voltage	525-kV AC.
(b) Capacity	To be determined.
(c) Point of Origin	Hassayampa substation; Sec. 3, T1S, R6W.
(d) Intermediate Point	Pinal West 500/230-kV substation to be constructed in 2006, in the vicinity of the town of Mobile; Sec. 18, T5S, R2E
(e) Point of Termination	S.E. Valley 500/230-kV substation to be constructed in 2006, in the Coolidge/Florence area.
(f) Length	Approximately 120 miles, some built single-circuit and some built double-circuit.
Routing	South and east from Hassayampa to the vicinity of the town of Mobile, then east to the new S.E. Valley substation.
Purpose	This project is a result of the CATS study. The line will increase import capability to the Phoenix Metropolitan area as well as increase the export capability from the Palo Verde/Hassayampa area. It is anticipated the line will be a joint participation project with SRP as the project manager.
Date	
(a) Construction Start	2005
(b) Estimated In Service	2006

An application for a Certificate of Environmental Compatibility has not yet been filed.

ARIZONA PUBLIC SERVICE COMPANY
2003--2012
Ten-Year Plan

Planned Transmission Description
2006

Line Designation	Santa Rosa-Pinal West 230-kV line.
Size	
(a) Voltage	230-kV AC.
(b) Capacity	736 MVA.
(c) Point of Origin	Santa Rosa substation; Sec. 30, T5S, R4E.
(d) Intermediate Point	None.
(e) Point of Termination	Pinal West 500/230-kV substation to be constructed in 2006, in the vicinity of the town of Mobile; Sec. 18, T5S, R2E.
(f) Length	Approximately 20 miles of single-circuit line.
Routing	Per Certificate for Santa Rosa-Gila Bend line.
Purpose	This 230-kV line will provide an additional 230-kV transmission path into Southern Arizona. This will enhance the reliability and quality of electric service while supplying the growing demand for electric power for the towns and adjacent rural areas in Southern Arizona. At the same time, transmission capacity between the Phoenix Metropolitan area and the southern portions of the APS transmission system will be increased, thus enhancing APS' ability to transmit economical power to the Phoenix load center when available.
Date	
(a) Construction Start	2005
(b) Estimated In Service	2006

Certificate of Environmental Compatibility issued 1/6/83 (Case No. 61, Decision No. 53389). However, the designation of the Sonoran National Monument across part of the certificated route may require additional state or federal regulatory action prior to constructing the project.

Arizona Public Service Company
2003 —2012
Ten-Year Plan

Planned Transmission Description
2007

Line Designation	Silver King loop-in of Cholla-Saguaro 500-kV line.
Size	
(a) Voltage	525-kV AC.
(b) Capacity	To be determined.
(c) Point of Origin	Cholla- Saguaro 500-kV line where it passes SRP's Silver King substation; Sec. 15, T1S, R13E.
(d) Intermediate Point	None.
(e) Point of Termination	SRP's Silver King substation; Sec. 15, T1S, R13E.
(f) Length	Approximately 1 or 2 spans each of two single-circuit lines.
Routing	Cholla-Saguaro 500-kV line is adjacent to the Silver King 500-kV substation. Therefore, it will be just one or two spans.
Purpose	This project is a result of the CATS study. The project will increase the reliability of the EHV system and increase the import capability into the Phoenix Metropolitan area.
Date	
(a) Construction Start	2007
(b) Estimated In Service	2007

Certificate of Environmental Compatibility is not needed for this project.

Arizona Public Service Company
2003 —2012
Ten-Year Plan

Planned Transmission Description
2008

Line Designation	Trilby Wash-TS2-TS3 230-kV line.
Size	
(a) Voltage	230-kV AC.
(b) Capacity	To be determined.
(c) Point of Origin	Trilby Wash 230/69-kV substation to be constructed in 2008 approximately 11 miles west of Westwing substation; Sec. 23, T4N, R2W.
(d) Intermediate Point	TS2 230/69-kV substation to be constructed in 2012, planned for the northwest corner of the Beardsley Canal and Olive Ave.; Sec. 29, T3N, R2W.
(e) Point of Termination	TS3 substation, to be constructed in 2006, planned in the general area of Perryville Rd. and Indian School Rd.; Sec. 28, T2N, R2W.
(f) Length	Approximately 15 miles of single-circuit line.
Routing	South from Trilby Wash substation for approximately 7 miles to the TS2 substation. Then east and south from TS2 substation for approximately 8 miles to the TS3 substation.
Purpose	This line is required to serve the increasing need for electric energy in the western Phoenix Metropolitan area, providing improved reliability and continuity of service for growing communities such as El Mirage, Surprise, and Youngtown.
Date	
(a) Construction Start	2006
(b) Estimated In Service	2008

The TS3-TS2 230-kV line will be sited as part of the West Valley South project in 2003. The Trilby Wash-TS2 230-kV line will be sited as part of the West Valley North project. An application for the Certificate of Environmental Compatibility for the West Valley North project is planned for 2003 or 2004.

Arizona Public Service Company
2003—2012
Ten-Year Plan

Planned Transmission Description
2008

Line Designation	Raceway-Avery 230-kV line.
Size	
(a) Voltage	230-kV AC.
(b) Capacity	1200 MVA.
(c) Point of Origin	Raceway substation located along the Westwing-New Waddell 230-kV line, approximately 3 miles south of the New Waddell Dam; Sec. 4, T5N, R1E.
(d) Intermediate Point	None.
(e) Point of Termination	A new Avery substation near Dove Valley Road and 39th Avenue; Sec. 10, T5N, R2E.
(f) Length	Approximately 10 miles of double-circuit line.
Routing	South from Raceway substation approximately 1 mile, paralleling existing transmission lines, then east approximately 9 miles to the new Avery substation.
Purpose	This line will be essential to serve projected need for electric energy in the area immediately north of the Phoenix Metropolitan area. Additionally, improved reliability and continuity of service will result for the area's growing communities such as Anthem, Desert Hills and New River.
Date	
(a) Construction Start	2004
(b) Estimated In Service	2008

Application for a Certificate of Environmental Compatibility was filed in September of 2002. This line is one of three projects shown in this Ten-Year filing which is being pursued under one CEC application for the North Valley Project. The other lines in the North Valley Project are the Westwing-Raceway 230-kV line and the Avery-Misty Willow-Pinnacle Peak 230-kV line.

Arizona Public Service Company
2003—2012
Ten-Year Plan

Planned Transmission Description
2008

Line Designation	Palo Verde/Hassayampa-TS5 500-kV line.
Size	
(a) Voltage	525-kV AC.
(b) Capacity	To be determined.
(c) Point of Origin	Palo Verde Power Plant or Hassayampa 500-kV substation.
(d) Intermediate Point	None.
(e) Point of Termination	TS5 500/230-kV substation; south and west of Morristown. Location to be determined.
(f) Length	Approximately 25 miles of single-circuit line.
Routing	Generally north from Palo Verde/Hassayampa for approximately 25 miles.
Purpose	This line will be needed to serve projected need for electric energy in the area immediately north and west of the Phoenix Metropolitan area. It will increase the import capability to the Phoenix Metropolitan area as well as increase the export capability from the Palo Verde/Hassayampa area.
Date	
(a) Construction Start	2006
(b) Estimated In Service	2008

An application for a Certificate of Environmental Compatibility has not yet been filed. This line is one of two projects shown in this Ten-year Plan which will be pursued under one CEC application. The other project is TS5-Trilby Wash 230-kV line.

Arizona Public Service Company
2003 —2012
Ten-Year Plan

Planned Transmission Description
2008

Line Designation	TS5-Trilby Wash 230-kV lines.
Size	
(a) Voltage	230-kV AC.
(b) Capacity	To be determined.
(c) Point of Origin	TS5 500/230-kV substation; south and west of Morristown. Location to be determined.
(d) Intermediate Point	None.
(e) Point of Termination	Trilby Wash 230/69-kV substation to be constructed in 2008; approximately 11 miles southwest of Westwing substation; Sec. 23, T4N, R2W.
(f) Length	Approximately 20 miles of double-circuit line.
Routing	West from the new TS5 substation to the Trilby Wash substation.
Purpose	These lines will be needed to increase import capability to the Phoenix Metropolitan area and serve projected need for electric energy in the area immediately north and west of the Phoenix Metropolitan area. Additionally, improved reliability and continuity of service will result for the area's growing communities such as El Mirage, Surprise, and Youngtown.
Date	
(a) Construction Start	2006
(b) Estimated In Service	2008

An application for a Certificate of Environmental Compatibility has not yet been filed. This line is one of two projects shown in this Ten-Year filing which will be pursued under one CEC application. The other project is Palo Verde-TS5 500-kV line.

Arizona Public Service Company
2003 —2012
Ten-Year Plan

Planned Transmission Description
2009

Line Designation	Pinnacle Peak-Misty Willow-Avery 230-kV lines.
Size	
(a) Voltage	230-kV AC.
(b) Capacity	1200 MVA.
(c) Point of Origin	Pinnacle Peak substation; Sec. 25, T4N, R3E.
(d) Intermediate Point	Misty Willow substation to be constructed in 2011; Sec. 4, T4N, R3E.
(e) Point of Termination	Avery substation near Dove Valley Road and 39th Avenue; Sec. 10, T5N, R2E.
(f) Length	Approximately 16 miles of double-circuit line.
Routing	Along the existing 230-kV right-of-way, west 10 miles from Pinnacle Peak substation to approximately Interstate 17, generally parallel to and south of Happy Valley Road; then north 5 miles, generally parallel to Interstate 17, to Dove Valley Road, then west to the new Avery substation.
Purpose	These lines will be essential to service projected need for electric energy in the area immediately north of the Phoenix Metropolitan area. Additionally, improved reliability and continuity of service will result for the growing communities in the areas of Anthem, Desert Hills, and New River.
Date	
(a) Construction Start	2004
(b) Estimated In Service	2009

An application for a Certificate of Environmental Compatibility was filed in September. This line is one of three projects shown in this Ten-Year Plan which will be pursued under one CEC application as the North Valley Project. The other lines in the North Valley Project are Westwing-Raceway 230-kV and Raceway-Avery 230-kV lines.

Arizona Public Service Company
2003—2012
Ten-Year Plan

Planned Transmission Description
2009

Line Designation	Cholla-Second Knoll 230-kV line.
Size	
(a) Voltage	230-kV AC.
(b) Capacity	To be determined.
(c) Point of Origin	Cholla Power Plant; Sec. 23, T18N, R19E.
(d) Intermediate Point	None.
(e) Point of Termination	Second Knoll 230-kV substation to be built in 2009; T13N, R20E.
(f) Length	Approximately 36 miles of single-circuit line.
Routing	South from the Cholla substation.
Purpose	This line will be needed to serve projected need for electric energy in Show Low and the surrounding communities.
Date	
(a) Construction Start	2008
(b) Estimated In Service	2009

An application for a Certificate of Environmental Compatibility has not yet been filed.

Arizona Public Service Company
2003 —2012
Ten-Year Plan

Planned Transmission Description
2009

Line Designation	Table Mesa loop-in of Navajo-Westwing 500-kV line.
Size	
(a) Voltage	525-kV AC.
(b) Capacity	To be determined.
(c) Point of Origin	Navajo-Westwing 500-kV line, near the crossing of Interstate 17; Sec. 34, T8N, R2E.
(d) Intermediate Point	None.
(e) Point of Termination	Table Mesa 500/230-kV substation near the crossing of the Navajo-Westwing 500-kV line and Interstate 17. Location yet to be determined.
(f) Length	To be determined.
Routing	From the Navajo-Westwing 500-kV line near where it crosses Interstate 17, to the Table Mesa substation.
Purpose	The loop-in of Table Mesa 500-kV line will be needed to increase system reliability and increase the import capability to the Phoenix Metropolitan area.
Date	
(a) Construction Start	2009
(b) Estimated In Service	2009

An application for a Certificate of Environmental Compatibility has not yet been filed. These lines are one of three projects shown in this Ten-Year filing which will be pursued under one CEC application. The other projects are TS5-Table Mesa 500-kV and Table Mesa-Raceway 230-kV lines.

Arizona Public Service Company
2003 —2012
Ten-Year Plan

Planned Transmission Description
2009

Line Designation	Table Mesa-Raceway 230-kV lines.
Size	
(a) Voltage	230-kV AC.
(b) Capacity	To be determined.
(c) Point of Origin	Table Mesa 500/230-kV substation near the crossing of the Navajo-Westwing 500-kV lines and Interstate 17. Location yet to be determined.
(d) Intermediate Point	None.
(e) Point of Termination	Raceway substation located along the Westwing-New Waddell 230-kV line, approximately 3 miles south of the New Waddell Dam; Sec. 4, T5N, R1E.
(f) Length	To be determined.
Routing	South from the new Table Mesa substation paralleling existing transmission lines, approximately 16 miles to the Raceway substation.
Purpose	These lines will be needed to increase import capability to the Phoenix Metropolitan area and serve projected need for electric energy in the area immediately north of the Phoenix Metropolitan area. Additionally, improved reliability and continuity of service will result for the area's growing communities such as Anthem, Desert Hills and New River.
Date	
(a) Construction Start	2008
(b) Estimated In Service	2009

An application for a Certificate of Environmental Compatibility has not yet been filed. This project is one of three projects shown in this Ten-Year filing which will be pursued under one CEC application. The other projects are Table Mesa 500-kV loop-in of Navajo-Westwing 500-kV line and TS5-Table Mesa 500-kV line.

Arizona Public Service Company
2003—2012
Ten-Year Plan

Planned Transmission Description
2010

Line Designation	TS5 – Table Mesa 500-kV line.
Size	
(a) Voltage	525-kV AC.
(b) Capacity	To be determined.
(c) Point of Origin	TS5 500/230-kV substation approximately south and west of Morristown. Location to be determined.
(d) Intermediate Point	None.
(e) Point of Termination	Table Mesa 500/230-kV substation near the crossing of the Navajo-Westwing 500-kV lines and Interstate 17. Location yet to be determined.
(f) Length	Approximately 60 miles of single-circuit line.
Routing	North from TS5 substation approximately 20 miles and then in a northeasterly direction to the Table Mesa substation.
Purpose	This line will be needed to serve projected need for electric energy in the area immediately north and west of the Phoenix Metropolitan area. It will increase the import capability to the Phoenix Metropolitan area as well as increase the export capability from the Palo Verde/Hassayampa area.
Date	
(a) Construction Start	2008
(b) Estimated In Service	2010

An application for a Certificate of Environmental Compatibility has not yet been filed. This project is one of three projects shown in this Ten-Year filing which will be pursued under one CEC application. The other projects are Table Mesa 500-kV loop-in of Navajo-Westwing 500-kV line and Table Mesa-Raceway 230-kV line.

Arizona Public Service Company
2003 —2012
Ten-Year Plan

Planned Transmission Description
2010

Line Designation	Table Mesa loop-in of Gavilan Peak-Prescott 230-kV line.
Size	
(a) Voltage	230-kV AC.
(b) Capacity	To be determined.
(c) Point of Origin	Gavilan Peak-Prescott 230-kV line where it meets Interstate 17.
(d) Intermediate Point	None.
(e) Point of Termination	Table Mesa 500/230-kV substation near the crossing of the Navajo-Westwing 500-kV lines and Interstate 17. Location yet to be determined.
(f) Length	To be determined.
Routing	From the Gavilan Peak-Prescott 230-kV line to the Table Mesa substation.
Purpose	This project will be needed to serve projected need for electric energy in the area immediately north of the Phoenix Metropolitan area. Additionally, improved reliability and continuity of service will result for the growing communities in the areas of Desert Hills, Anthem, and New River.
Date	
(a) Construction Start	2010
(b) Estimated In Service	2010

Certificate of Environmental Compatibility is not needed for this project.

Arizona Public Service Company
2003 —2012
Ten-Year Plan

Planned Transmission Description
2010

Line Designation	Westwing – Raceway 230kV Line.
Size	
(a) Voltage	230-kV AC.
(b) Capacity	1200 MVA.
(c) Point of Origin	Westwing substation; Sec 12, T4N, R1W.
(d) Intermediate Point	None.
(e) Point of Termination	Raceway substation located along the Westwing-New Waddell 230-kV line, approximately 3 miles south of the Waddell Dam; Sec. 4, T5N, R1E.
(f) Length	Approximately 7 miles of line on double-circuit poles.
Routing	Northeast from Westwing substation paralleling existing transmission lines to the Raceway substation which will be adjacent to the existing transmission lines.
Purpose	The 230-kV line will serve increasing loads in the far north and northwest parts of the Phoenix Metropolitan area and provide contingency support for multiple Westwing 500/230-kV transformer outages.
Date	
(a) Construction Start	2007
(b) Estimated In Service	2010

An application for a Certificate of Environmental Compatibility was filed in September of 2002. This line is one of three projects shown in this Ten-Year filing which is being pursued under one CEC application for the North Valley Project. The other lines involved in the North Valley Project are Raceway-Avery 230kV and Avery-Misty Willow-Pinnacle Peak 230kV lines.

Arizona Public Service Company
2003 —2012
Ten-Year Plan

Planned Transmission Description
2010

Line Designation	Gila Bend-Yuma 230-kV line.
Size	
(a) Voltage	230-kV AC.
(b) Capacity	To be determined.
(c) Point of Origin	Gila Bend substation; Sec. 36, T2N, R1W.
(d) Intermediate Point	None.
(e) Point of Termination	An existing substation to be selected in or near Yuma, Arizona.
(f) Length	Approximately 115 mile of single-circuit line.
Routing	West from Gila Bend to Yuma, generally parallel to Interstate 8.
Purpose	As a new transmission path to Yuma County, this 230-kV line will provide transmission capacity required to supplement limited transmission and generation resources in the Yuma area. This 230-kV line will also provide another source for the Gila Bend area.
Date	
(a) Construction Start	2006
(b) Estimated In Service	2010

An application for a Certificate of Environmental Compatibility has not yet been filed. This project has been delayed until 2010 due to the proposed addition of a second 500/69-kV transformer at the North Gila substation which increases transmission import capability into the Yuma area.

Arizona Public Service Company
2003—2012
Ten-Year Plan

Planned Transmission Description
2012

Line Designation	Westwing-El Sol 230-kV line.
Size	
(a) Voltage	230-kV AC.
(b) Capacity	1200 MVA.
(c) Point of Origin	Westwing substation; Sec. 12, T4N, R1W.
(d) Intermediate Point	None.
(e) Point of Termination	El Sol substation; Sec. 30, T3N, R1E.
(f) Length	Approximately 11 miles of single-circuit line.
Routing	Per Certificate.
Purpose	This line will increase system capacity to serve growing demand for electric energy in the Phoenix Metropolitan area, while maintaining system reliability and integrity for delivery of bulk power from Westwing south into the APS Phoenix Metropolitan area 230-kV transmission system.
Date	
(a) Construction Start	2010
(b) Estimated In Service	2012

Certificate of Environmental Compatibility issued 7/26/73 (Case No. 9, docket No. U-1345). Note that this Certificate authorizes two double-circuit lines. Construction of the first double-circuit line was completed in March 1975. Construction of the second line, planned to be built with double-circuit capability but initially operated with a single circuit, is described above.

ARIZONA PUBLIC SERVICE COMPANY
2003--2012
Ten-Year Plan

Planned Transmission Description
2012

Line Designation	Gila Bend-Pinal West 230-kV line.
Size	
(a) Voltage	230-kV AC.
(b) Capacity	736 MVA.
(c) Point of Origin	Gila Bend substation; Sec. 3, T6S, R5W.
(d) Intermediate Point	None.
(e) Point of Termination	Pinal West 500/230-kV substation to be constructed in 2006, in the vicinity of the town of Mobile; Sec. 18, T5S, R2E.
(f) Length	Approximately 45 miles of single-circuit line.
Routing	Per Certificate for Santa Rosa-Gila Bend line.
Purpose	This 230-kV line will provide an additional 230-kV transmission path to the existing Gila Bend substation, thereby enhancing the reliability and quality of electric service in the town of Gila Bend and adjacent rural areas, while supplying the growing demand for electric power. At the same time, transmission capacity to the Phoenix Metropolitan area from the southern portions of the APS transmission system will be increased, thus enhancing APS ability to transmit economical power to the Phoenix load center when available.
Date	
(a) Construction Start	2011
(b) Estimated In Service	2012

Certificate of Environmental Compatibility issued 1/6/83 (Case No. 61, Decision No. 53389). However, the designation of the Sonoran National Monument across part of the certificated route may require additional state or federal regulatory action prior to constructing the project.

Arizona Public Service Company
2003 —2012
Ten-Year Plan

Planned Transmission Description
2012

Line Designation	Mazatzal loop-in of Cholla-Pinnacle Peak 345-kV line.
Size	
(a) Voltage	345-kV AC.
(b) Capacity	To be determined.
(c) Point of Origin	Cholla-Pinnacle Peak 345-kV line; near Sec. 3, T8N, R10E.
(d) Intermediate Point	None.
(e) Point of Termination	Mazatzal 345/69-kV substation to be built in 2012; approximately Sec. 3, T8N, R10E.
(f) Length	Approximately 1 span each of two single-circuit lines.
Routing	The Mazatzal substation will be built adjacent to the Cholla-Pinnacle Peak 345-kV line so it will be just one or two spans.
Purpose	This substation will be needed to serve projected need for electric energy in the area of Payson and the surrounding communities. Additionally, improved reliability and continuity of service will result for the growing communities in the Payson area.
Date	
(a) Construction Start	2011
(b) Estimated In Service	2012

Certificate of Environmental Compatibility is not needed for this project.

Planned Transmission Description
TBD

Line Designation	Palo Verde - Pinal West - Saguaro 500-kV line.
Size	
(a) Voltage	525-kV AC.
(b) Capacity	To be determined.
(c) Point of Origin	Palo Verde Power Plant; Sec. 34, T1N, R6W.
(d) Intermediate Point	Pinal West substation in the Casa Grande area. Hassayampa and Jojoba substations are also possible interconnection points.
(e) Point of Termination	Saguaro substation; Sec. 14, T10S, R10E.
(f) Length	Approximately 130 miles of new line to be built on single-circuit poles or towers. Some sections may be built on double-circuit structures.
Routing	South and east from the Palo Verde switchyard, paralleling existing transmission lines for part of the route. The approved corridor is defined in the CEC identified below.
Purpose	This line is the result of the joint participation CATS study. The line will be needed to increase the adequacy of the existing EHV transmission system and permit increased power delivery throughout the state. It is anticipated the line will be a joint participation project.
Date	
(a) Construction Start	TBD
(b) Estimated In Service	TBD

Certificate of Environmental Compatibility issued 01/23/1976 (Case No. 24, Decision No. 46802).

2

ARIZONA PUBLIC SERVICE COMPANY

TRANSMISSION PLANNING PROCESS

AND GUIDELINES

APS Transmission Planning
JANUARY 2003

TRANSMISSION PLANNING PROCESS AND GUIDELINES

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TRANSMISSION PLANNING PROCESS AND GUIDELINES

I. INTRODUCTION AND PURPOSE

The Transmission Planning Process and Guidelines (Guidelines) are used by Arizona Public Service Company (APS) to assist in planning its Extra High Voltage (EHV) transmission system (345kV and above) and High Voltage transmission system (230kv and 115kV). In addition to these Guidelines, APS follows the Western Systems Coordinating Council's (WSCC) regional planning reliability criteria for system disturbance and performance levels.[1] These WSCC Reliability Criteria, which can be found in their entirety on the WSCC website, are (1) Reliability Criteria for Transmission System Planning and (2) Minimum Operating Reliability Criteria. These Guidelines are for internal use by APS and may be changed or modified at any time without notice. Thus, these Guidelines should not be used by others without consultation with APS.

II. PLANNING METHODOLOGY

A. General

APS uses a deterministic approach for transmission system planning. Under this approach, system performance should meet certain specific criteria under normal conditions (all lines in service) and for any single contingency condition (any one element out of service). In general, an adequately planned transmission system will:

- Provide an acceptable level of service at the lowest cost for normal and single contingency operating conditions.
- Not result in the loss of load for any single contingency outage.
- Not result in cascading, overloaded equipment, or unacceptable voltage conditions for any single contingency outage.
- Work in compliment with local generation in load constrained areas.

At present, probabilistic computational techniques are not directly used in the transmission planning process. However, system reliability performance is examined in the solution of switchyard circuit breaker arrangements, transformer reserve

[1] The WSCC is in the process of merging with two other regional transmission authorities to form the Western Electricity Coordinating Council ("WECC").

capacity, and in the choice of using single contingency outages for reserve transmission capacity. Further, deterministic guidelines generally provide some margin. The WSCC is developing and plans to phase in probabilistic performance criteria in its planning criteria, which APS generally follows.

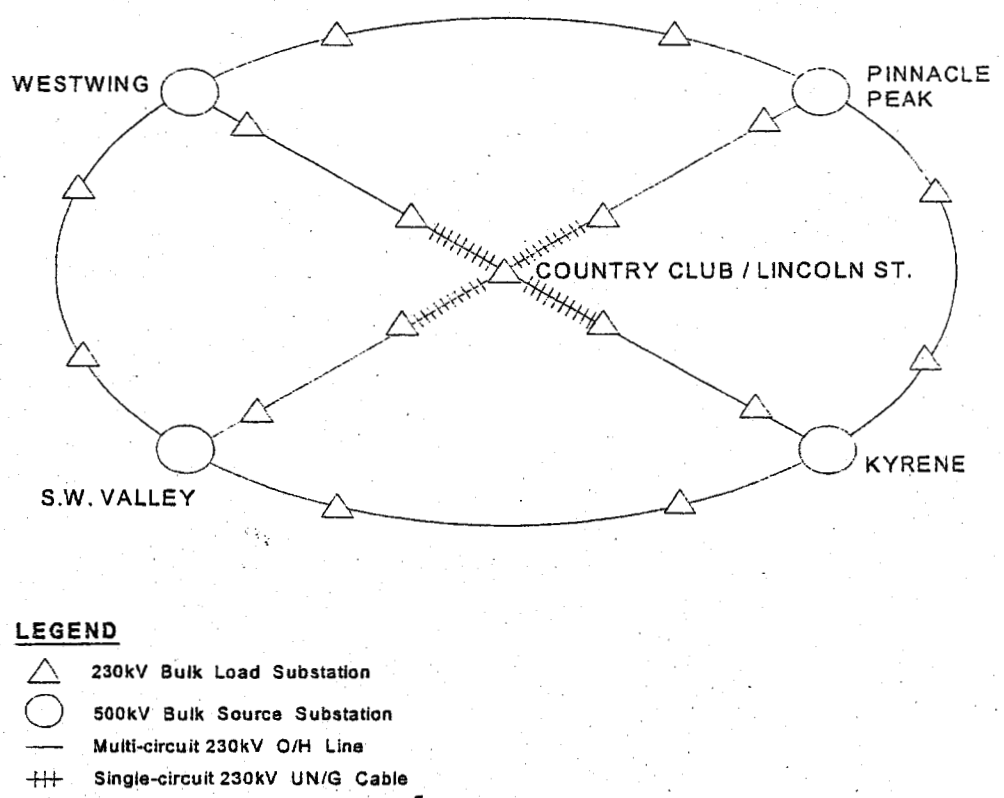
These planning methodologies, assumptions, and guidelines are used as the basis for the development of future transmission facilities. Additionally, consideration of potential alternatives to transmission facilities (such as distributed generation or new technologies) are evaluated on a case-specific basis. As the system grows and changes, and as more planning tools become available to the transmission planning engineer, revisions or additions to these guidelines will be made as appropriate.

B. 230kV Long Range System

APS' planning process begins with the review of the major long-range 230kV system requirements. APS' philosophy regarding long-range 230kV transmission planning has been to develop four major source points (Westwing, Pinnacle Peak, Kyrene, and Southwest Valley) in the Valley. *See* Figure 1. In the future, other major source points may become necessary.

FIGURE 1

APS VALLEY LONG RANGE
230KV TRANSMISSION PHILOSOPHY



The Long Range Substation Development Master Plan for the Phoenix Metropolitan Area will be utilized in determining the location of future 230/69kV and 69/12.5kV substations. This Master Plan considered future land use plans that were developed by government agencies, Landis aerial photo maps, and master plans that were provided by private developers. Other factors considered in developing the Master Plan included (1) APS' long-range forecasted load densities per square mile for residential, commercial, and industrial loads, (2) the 12.5kV service areas and associated number of 69/12.5kV substations and (3) the 69kV service areas and associated 230/69kV substations for the Phoenix area.

C. Ten Year System Expansion Plans

The next step is to conduct detailed 230kV facility studies to develop APS' ten-year 230kV system expansion plans. In developing these plans, the 69kV and 230kV system requirements are coordinated to minimize future expansion of facilities, while at the same time achieving the long range 230kV and 69kV substation expansion plans set forth in the Master Plan. Consideration is given to load growth patterns due to master planned developments, new housing developments, shopping centers, high/mid rise buildings, and industrial parks. Also considered are other system changes affected by right-of-way, facilities siting constraints, routing of future transportation corridors, and joint planning with neighboring utilities and governmental entities.

D. Facilities Keyed to Generation/Resource Additions

New EHV transmission facilities are also required in conjunction with generation resources due to (1) a "merchant" request by an Independent Power Producer (IPP) for generator interconnection to the APS system, (2) a "merchant" request for point-to-point transmission service from the generator (receipt point) to the designated delivery point or (3) designation of new resources to serve APS network load (including removal of other units' native load designation).

If an interconnection or transmission service request is made by an IPP to interconnect to or deliver power over the APS system, APS will perform the study work and enter into appropriate agreements pursuant to applicable FERC regulations and APS' Open Access Transmission Tariff. At present, FERC is reviewing and standardizing the interconnection process and agreements. APS may design and construct, at the IPP's expense, transmission facilities identified in the Facilities Study that are needed to accommodate the interconnection or a transmission service request.

New transmission facilities may also be required due to re-designation of or units to serve APS' network load.

E. Generation Schedules

For planning purposes, economic dispatch of network resources are determined for APS' system peak load in the following manner:

a. Determine base generation available and schedule these units at maximum output.
b. Determine resources purchased from other utilities, IPPs, or power marketing agencies.
c. Determine APS' spinning reserve requirements.
d. Schedule intermediate generation (oil/gas steam units) such that the spinning reserve requirements in section (c) above are met.
e. Determine the amount of peaking generation (combustion turbine units) required to supply the remaining system peak load.

Phoenix area network resources are dispatched based on economics and any existing import limitations. When possible, spinning reserve will be carried on higher cost Phoenix area network generating units.

Generation output schedules for interconnected utilities and IPPs are based upon consultation with the neighboring utilities and IPPs or as modeled in the latest data in WSCC coordinated study cases.

F. Study Period

Transmission plans are updated on a continuing basis to determine the projected facilities needs for each year over a ten-year period. These plans then become a basis for the transmission capital budget and future facility construction. Each year the plans for the next ten years are developed by first determining the requirements for the tenth year, and then defining the additions required for each for the preceding nine years. Needs for specific projects are incorporated in these 10 years plans.

G. Regional Coordinated Planning

1. Western Systems Coordinating Council (WSCC)

APS is a member of the Western Systems Coordinating Council. The focus of the WSCC is on promoting the reliability of the interconnected bulk electric system. The WSCC provides the means for:

- Developing regional planning and operating criteria.
- Coordinating future plans.
- Compiling regional data banks for use by the member systems and the WSCC in conducting technical studies.
- Assessing and coordinating operating procedures and solutions to regional problems.
- Establishing an open forum with interested non-project participants to review the plan of service for a project.

2. Joint Studies

In many instances, EHV projects can serve the needs of several utilities, IPPs, or both. To this end, joint study efforts may be undertaken. Such joint study efforts endeavor to develop a plan which will meet the needs and desires of all individual companies.

H. Load Projections

APS substation load projections are based on the APS Corporate Load Forecast. Substation load projections for neighboring interconnected utilities or power agencies operating in the WSCC area are based on the latest data in WSCC coordinated study cases. Heavy summer loads are used for the studies.

I. Alternative Evaluations

1. General. In evaluating several alternative plans, comparisons of power flows, transient stability tests and fault levels are made first. After the alternatives are found that meet the system performance criteria in each of these three areas, comparisons may be made of the losses, transfer capability, impact on system operations and reliability of each of the plans. Finally, the costs of facility additions (capital cost items), costs of losses, and relative costs of transfer capabilities are determined. A brief discussion of each of these considerations follows.
2. Power Flow Analyses. Power flows of base case (all lines in service) and single contingency conditions are tested and should conform to the system performance criteria set forth in Section IV of these Guidelines. Double or multiple contingencies are examined, but in general, no facilities are planned for such conditions. Normal system voltages, voltage deviations and voltage extreme limitations are based upon operating experience resulting in acceptable voltage levels to the consumer. Power flow limits are based upon the thermal ratings and/or sag limitations of conductors or equipment, as applicable.

3. Transient Stability Studies. Stability guidelines are established to maintain system stability for single contingency, three-phase fault conditions. Double or multiple contingencies are examined, but in general, no facilities are planned for such conditions.
4. Short Circuit Studies. Three-phase and single-phase to ground fault studies are performed to ensure the adequacy of system protection equipment to clear and isolate faults.
5. Losses Analyses. A comparison of individual element and overall transmission system losses are made for each alternative plan being studied. The losses computed in the power flow program consist of the I^2R losses of lines and transformers and the core losses in transformers where represented.
6. Transfer Capability Studies. In evaluating the relative merits of one or more EHV transmission plans, both simultaneous and non-simultaneous transfer capability studies are performed to determine the magnitude of transfer capabilities between areas or load centers.
7. Subsynchronous Resonance (SSR). SSR phenomenon result from the use of series capacitors in the network where the tuned electrical network exchanges energy with a turbine generator at one or more of the natural frequencies of the mechanical system. SSR countermeasures are applied to prevent damage to machines as a result of transient current or sustained oscillations following a system disturbance. SSR studies are not used directly in the planning process. SSR countermeasures are determined after the transmission plans are finalized.
8. Economic Evaluation. In general, an economic evaluation of alternative plans consists of a cumulative present worth or equivalent annual cost comparison of capital costs.

III. PLANNING ASSUMPTIONS

A. General

1. Loads. Loads used for the APS system originate from the latest APS Corporate Load Forecast. In most cases, the corrected power factor of APS loads is 99.5%.
2. Generation and Other Resources. Generation dispatch is based on firm power and or transmission wheeling contracts including network resources designations.
3. Nominal Voltage Levels
   a. Nominal EHV design voltages are 500kV, 345kV, 230kV, and 115kV.
   b. Nominal EHV operating voltages are 535kV, 348kV, 239kV, and 119kV.

4. Sources of Data Bases. WSCC Heavy Summer base cases are the sources of the data bases. Loop flow (unscheduled flow), of a reasonable amount and direction, will be allowed for use in planning studies.
5. Voltage Control Devices. Devices which can control voltages are shunt capacitors, shunt reactors, TCUL and fixed-tap transformers, static VAR compensators, and machine VAR capabilities. If future voltage control devices are necessary, these devices will be evaluated based upon economics and the equipment's ability to obtain an adequate voltage profile on the EHV and HV systems.
6. Phase Shifters. In general, where phase shifters are used, schedules are held across the phase shifter in base case power flows and the phase shifter angle is held in the outage cases.
7. Conductor Sizes. Existing voltages utilized by APS are 230kV, 345kV, and 500kV. It is presently planned that the 345kV transmission system will not be expanded, thus all future APS EHV lines will be 500kV or 230kV. Planned 500kV lines will initially be modeled using tri bundle 1780 kCM ACSR conductor (Chukar) with a flat phase spacing of 32 ft./32 ft./64 ft. between phases, unless otherwise specified. Preferred construction for 230kV lines consists of 954 ACSS conductor on steel poles.
8. 69kV System Modeling. 230kV facility outages may result in problems to the underlying 69kV system due to the interconnection of those systems. For this reason, power flow cases include a detailed 69kV system representation. Solutions to any problems encountered on the 69kV system are coordinated with the subtransmission planning engineers.
9. Substation Transformers
   a. Bulk substation transformer banks may be made up of three-phase or three single-phase auto-transformers, depending upon bank size and economics. For larger banks where single-phase transformers are used, a fourth (spare) single-phase transformer will be used in a jack-bus arrangement to improve reliability and facilitate connection of the spare in the event of an outage of one of the single-phase transformers. Automatic tap-changing-under-load (TCUL) will be considered in the high voltage windings, generally with a range of plus or minus 10%. High voltage ratings will be 500kV or 345kV class and low voltage windings will be 230kV, 115kV or 69kV class.
   b. For high density load areas, both 230/69kV and 69/12.5kV transformers can be utilized. 230/69kV transformers will be rated at 113/150/188 MVA with a 65°C temperature rise, unless otherwise specified. 69/12.5kV transformers will

be rated at 25/33/41 MVA with a 65°C temperature rise, unless otherwise specified. 188 MVA transformers are utilized in future 230/69kV substations up to a 200 MVA load level. Beyond the 200 MVA load level, the economic sizes of 230/69kV transformers to serve the load are as follows:

1) Add the third 188 MVA transformer if the load potential is expected to be 400 MVA or less.
2) If the load potential is expected to exceed 400 MVA then another 230/69kV substation will be built.

With all elements in service, a transformer may be loaded up to its top Forced Oil Air (FOA) rating without sustaining any loss of service life. For a single contingency outage (loss of one transformer) the remaining transformer or transformers may be loaded up to 20% above their top FOA rating, unless heat test data indicate a different overload capability. The loss of service life sustained will depend on the transformer pre-loading and the outage duration. Tap setting adjustment capabilities on 230/69kV transformers will be ±5% from the nominal voltage setting (230/69kV) at 2 1/2% increments.

10. Switchyard Arrangements

a. 500kV and 345kV Substations. Existing 345kV switchyard arrangements use breaker-and-one-half, main-and-transfer or modified-paired element circuit breaker switching schemes. Because of the large amounts of power transferred via 500kV switchyards and the necessity of having adequate reliability, all 500kV circuit breaker arrangements are planned for an ultimate breaker-and-one-half scheme. If only three or four elements are initially required, the circuit breakers are connected in a ring bus arrangement, but physically positioned for a breaker-and-one-half scheme. The maximum number of elements to be connected in the ring bus arrangement is six. System elements such as generators, transformers and lines will be arranged in breaker-and-one-half schemes such that a failure of a center breaker will not result in the loss of two lines routed in the same general direction and will minimize the impact of losing two elements.

b. 230kV Substations. Future 230/69kV substations should be capable of serving up to 564 MVA of load. 400 MVA has historically been the most common substation load level in the Phoenix Metropolitan area. Future 230/69kV substations should accommodate up to four 230kV line terminations and up to three 230/69kV transformer bays. Based upon costs, as well as reliability and operating flexibility considerations, a breaker-and-one-half layout should be

utilized for all future 230/69kV Metropolitan Phoenix Area substations, with provision for initial development to be a ring bus. Any two 230/69kV transformers are to be separated by two breakers so that a stuck breaker will not result in an outage of both transformers.

11. Series Capacitor Application. Series capacitors may be used on EHV lines to increase system stability, for increased transfer capability and/or for control of power flow. The series capacitors may be lumped at one end of a line because of lower cost; however, the capacitors are generally divided into two banks, one at either end of a line, for improved voltage profile.
12. Shunt and Tertiary Reactor Application. Shunt and/or tertiary reactors may be installed to prevent open end line voltages from being excessive, in addition to voltage control. The open end line voltage must not be more than .05 per unit voltage greater than the sending end voltage. Tertiary reactors may also be used for voltage and var control as discussed above.

B. Power Flow Studies

1. System Stressing. Realistic generation capabilities and schedules should be used to stress the transmission system in order to maximize the transfer of resources during the maximum load condition.
2. Displacement. In cases where displacements (due to power flow opposite normal generation schedules) may have an appreciable effect on transmission line loadings, a reasonable amount of displacement (Generation Units) may be removed.

C. Transient Stability Studies

1. Fault Simulation. When studying system disturbances caused by faults, two conditions will be simulated:
   a. Three-phase-to-ground faults, and
   b. Single-line-to-ground faults with a stuck circuit breaker in one phase with back-up, delayed clearing.
2. Margin
   a. Generation margin may be applied for the contingencies primarily affected by generation, or
   b. Power flow margin may be applied for the contingencies primarily affected by power flow.
3. Unit Tripping. Generator unit tripping may be allowed to increase system stability performance.

4. Machine Reactance Representation. For transient stability studies, the unsaturated transient reactance of machines with full representation will be used.
5. Fault Damping. Fault damping will be applied to the generating units adjacent to faults. Fault damping will be determined from studies that account for the effect of generator amortisseur windings and the SSR filters.
6. Series Capacitor Switching. Series capacitors, locations to be determined from short circuit studies, will be flashed and reinserted as appropriate.

D. Short Circuit Studies

Three phase and single phase to ground faults will be evaluated.

1. Generation Representation

   All generation will be represented.
2. Machine Reactance Representation

   The saturated subtransient reactance (X''_d) values will be used.
3. Line Representation

   The transmission line zero sequence impedance (X_0) is assumed to be equal to three times the positive sequence impedance (X_1).
4. Transformer Representation

   The transformer zero sequence impedance (X_0) is assumed to be equal to the positive sequence impedance (X_1). Bulk substation transformers are modeled as auto-transformers. The two winding model is that of a grounded-wye transformer. The three winding model is that of a wye-delta-wye with a solid ground.

IV. SYSTEM PERFORMANCE

A. Power Flow Studies

1. Normal (Base Case Conditions)

   a. Voltage Levels

      1) General

         a) 500kV bus voltages will be maintained between 1.05 and 1.08 p.u. on a 500kV base.

         b) 345kV bus voltages will range between .99 and 1.04 p.u. on the 345kV system.

         c) 500kV and 345kV system voltages are used to maintain proper 230kV bus voltages.

d) Voltage on the 230kV and 115kV system should be between 1.01 p.u. and 1.05 p.u.

e) Tap settings for 230/69kV and 345/69kV transformers should be used to maintain low side (69kV) voltages of 1.03 p.u. to 1.04 p.u. Seasonal tap changes may be required.

2) Specific Buses

a) APS Pinnacle Peak 230kV bus voltage should be between 1.025 p.u. and 1.035 p.u.

b) APS Westwing 230kV bus voltage should be between 1.04 p.u. and 1.05 p.u.

c) Saguaro 115kV bus voltages will be approximately 1.035 p.u.

d) Voltage at the Prescott (DOE) 230kV bus should be approximately 1.02 p.u.

b. Facility Loading Limits

1) Transmission line loadings cannot exceed 100% of the continuous rating, which is based upon established conductor temperature limit or sag limitation.

2) Underground Cable loadings should not exceed 100% of the continuous rating with all elements in service. This rating is based on a cable temperature of 85^0C with no loss of cable life.

3) Transformers cannot exceed 100% of top FOA, 65^0 rise, and nameplate ratings.

4) Series capacitors cannot exceed 100% of continuous rating.

c. Interchange of Vars. Interchange of VARS between companies at interconnections will be reduced to a minimum and maintained near zero.

d. Distribution of Flow. Schedules on a new project will be compared to simulated power flows to ensure a reasonable level of flowability.

2. Single Contingency Outages

a. Voltage Levels. Maximum voltage deviation on APS' major buses cannot exceed 5%. This deviation level yields a close approximation to the post-transient VAR margin requirements of WSCC.

b. Facilities Loading Limits

1) Transmission line loadings cannot exceed 100% of the lesser of the sag limit or the emergency rating (30 minute rating) which is based upon established conductor temperature limit.

2) Underground cable loading should not exceed the emergency rating during a

single contingency outage. This rating is based on a cable temperature of 105°C for two hours of emergency operation with no loss of cable life.

3) Transformers cannot exceed 110% of top FOA 65° rise, name plate rating.

4) Series capacitors cannot exceed 100% of emergency rating.

c. Generator units used for controlling remote voltages will be modified to hold their base case terminal voltages.

d. Impact on Interconnected Systems. Single contingency outages will not cause overloads upon any neighboring transmission system.

B. Transient Stability Studies

Transient stability studies are primarily performed on the 500kV and 345kV systems.

1. Fault Simulation

a. Three-phase-to-ground faults, and

b. Single-line-to-ground faults simulating a stuck circuit breaker in one phase with back up, delayed clearing will be simulated. Fault clearing times of four cycles after fault inception (5 cycles for a 230kV fault) and a back-up clearing time of twelve cycles after fault inception is utilized. System elements are switched out at the appropriate clearing times, as applicable. Fault damping will be applied when applicable at fault inception.

2. Series Capacitor Switching. Series capacitors, at locations determined from short circuit studies, will be flashed at fault inception and will be reinserted depending on their reinsertion types.

3. System Stability. The system will be considered stable if the following conditions are met:

a. All machines in the system remain synchronized as demonstrated by the relative rotor angles.

b. System damping exists as demonstrated by the damping of relative rotor angles and the damping of voltage magnitude swings. Voltages for the first swing after fault clearing should not drop below 75% of pre-fault value with maximum time duration of 20 cycles for voltage dip exceeding 20%.

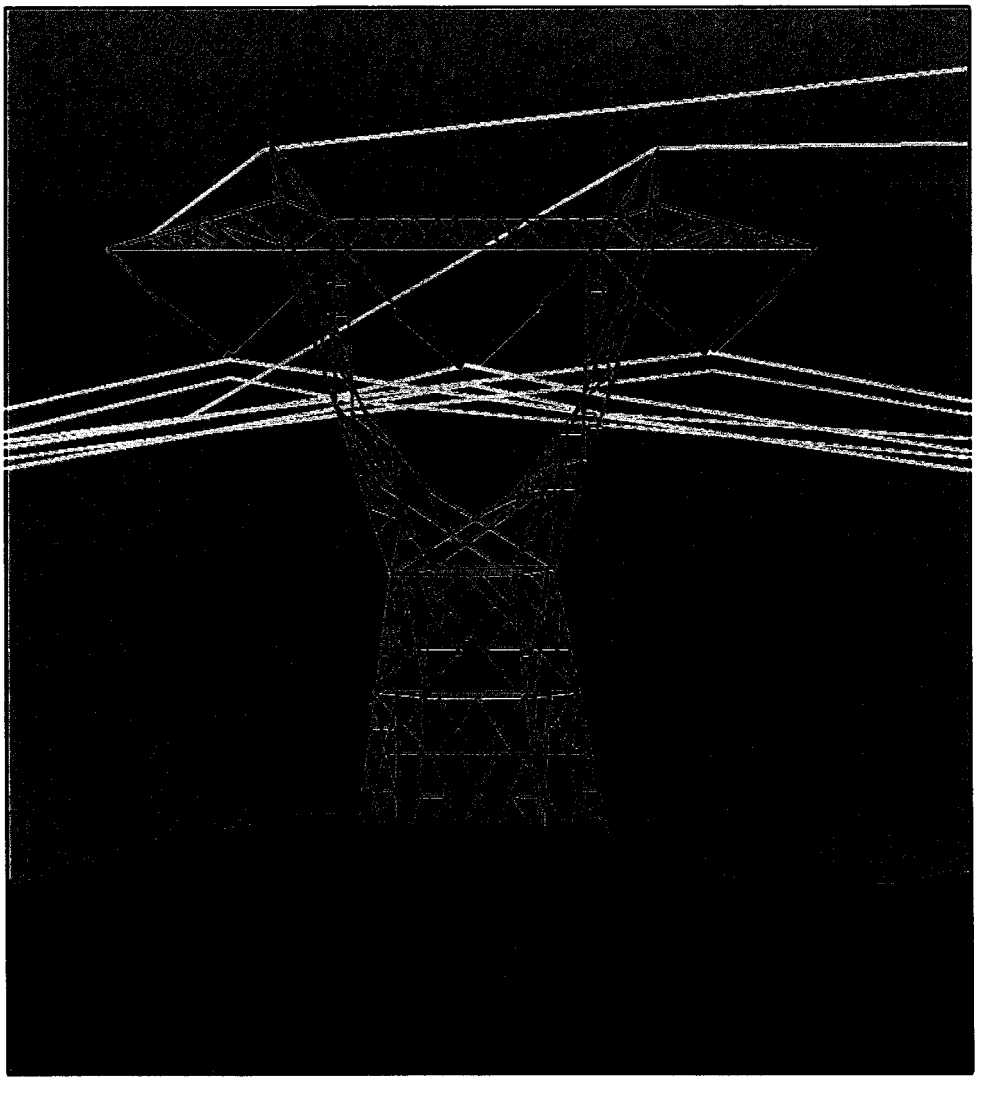
4. Re-closing. Automatic re-closing of circuit breakers controlling EHV facilities is not utilized.

C. Short Circuit Studies

Fault current shall not exceed 100% of the substation fault current interruption capability for three phase or single-line-to-ground faults.

3

2003 SYSTEM RATING MAPS



Prepared By

Transmission Operations
January 2003

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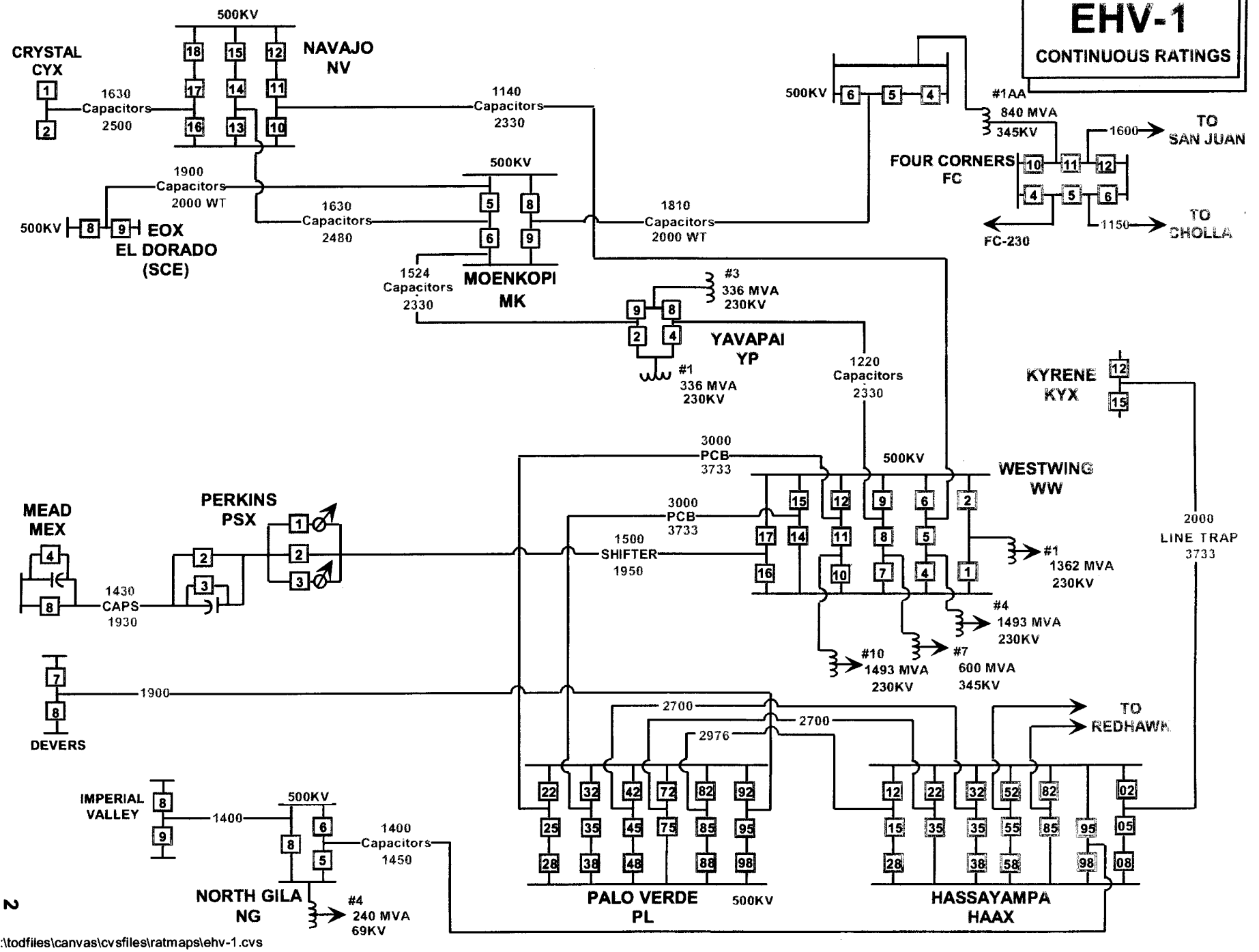
LEGEND
SYSTEM RATING MAPS

SYMBOL	DESCRIPTION
###	CURRENT LIMIT IN AMPS
—— ### ——	LIMITING ELEMENT
###	CONDUCTOR LIMIT IN AMPS
	TRANSFORMER LIMITS ARE IN MVA
————————	OVERHEAD TRANSMISSION LINE
— — — — — —	UNDERGROUND CABLE
M	MOTOR OPERATED SWITCH
V	VACCUM SWITCH
H	HYDRAULIC SWITCH
[1]	BREAKER NUMBER

EHV-1
CONTINUOUS RATINGS



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Rev. 10/11/02

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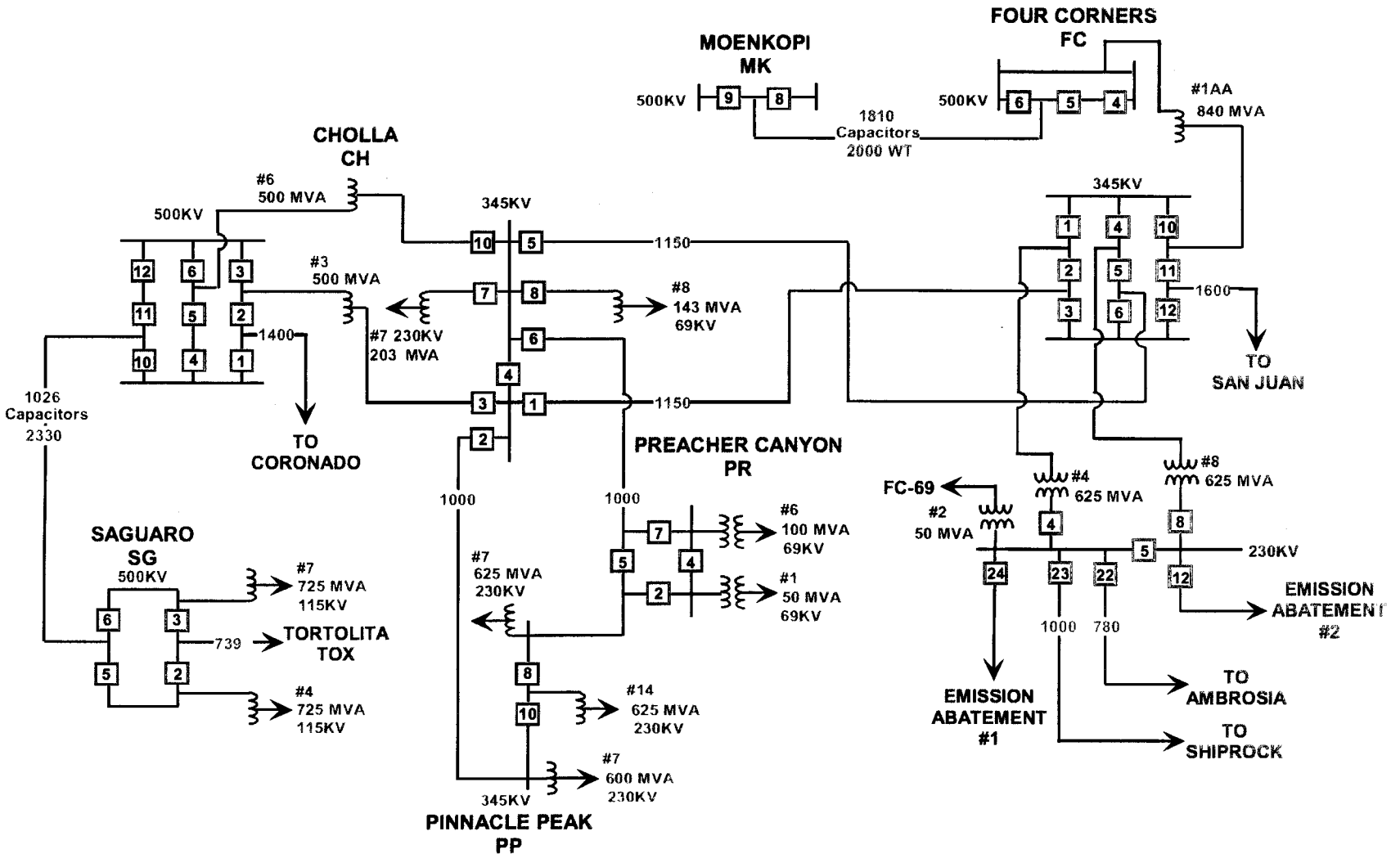

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Rev. 09/05/02

EMERGENCY RATING (AMPS)

EHV-1
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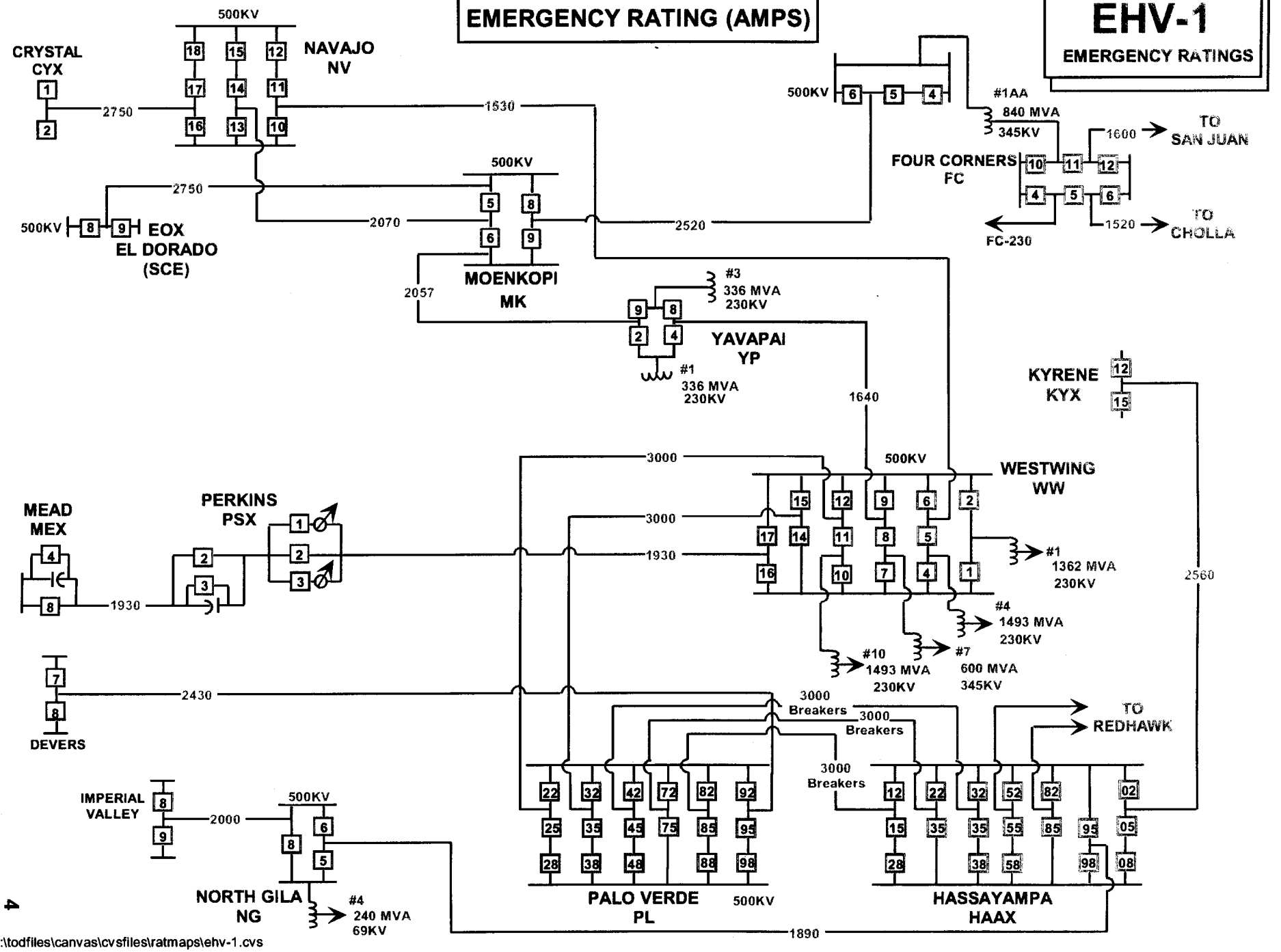

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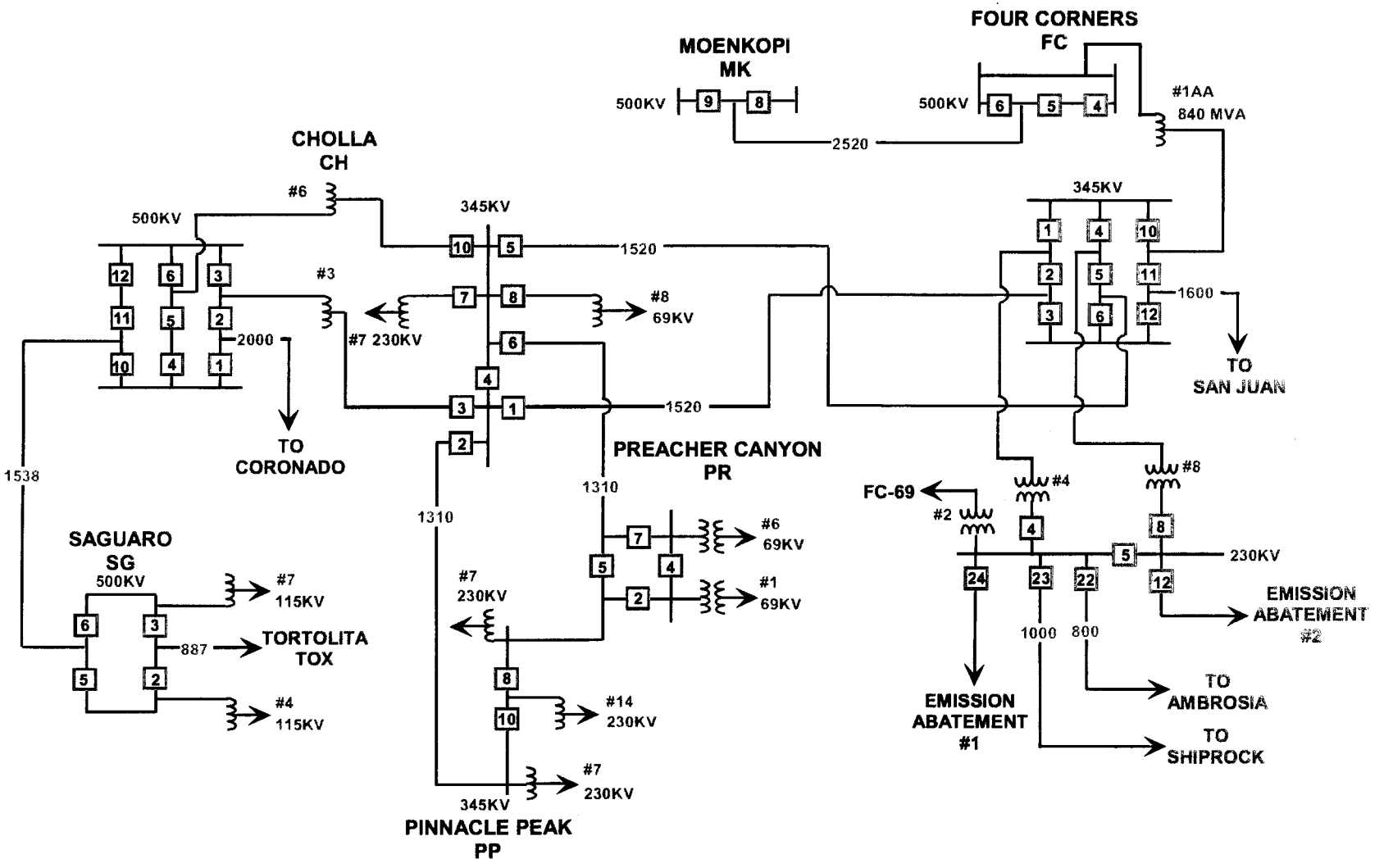

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Rev. 10/11/02

METRO 230KV
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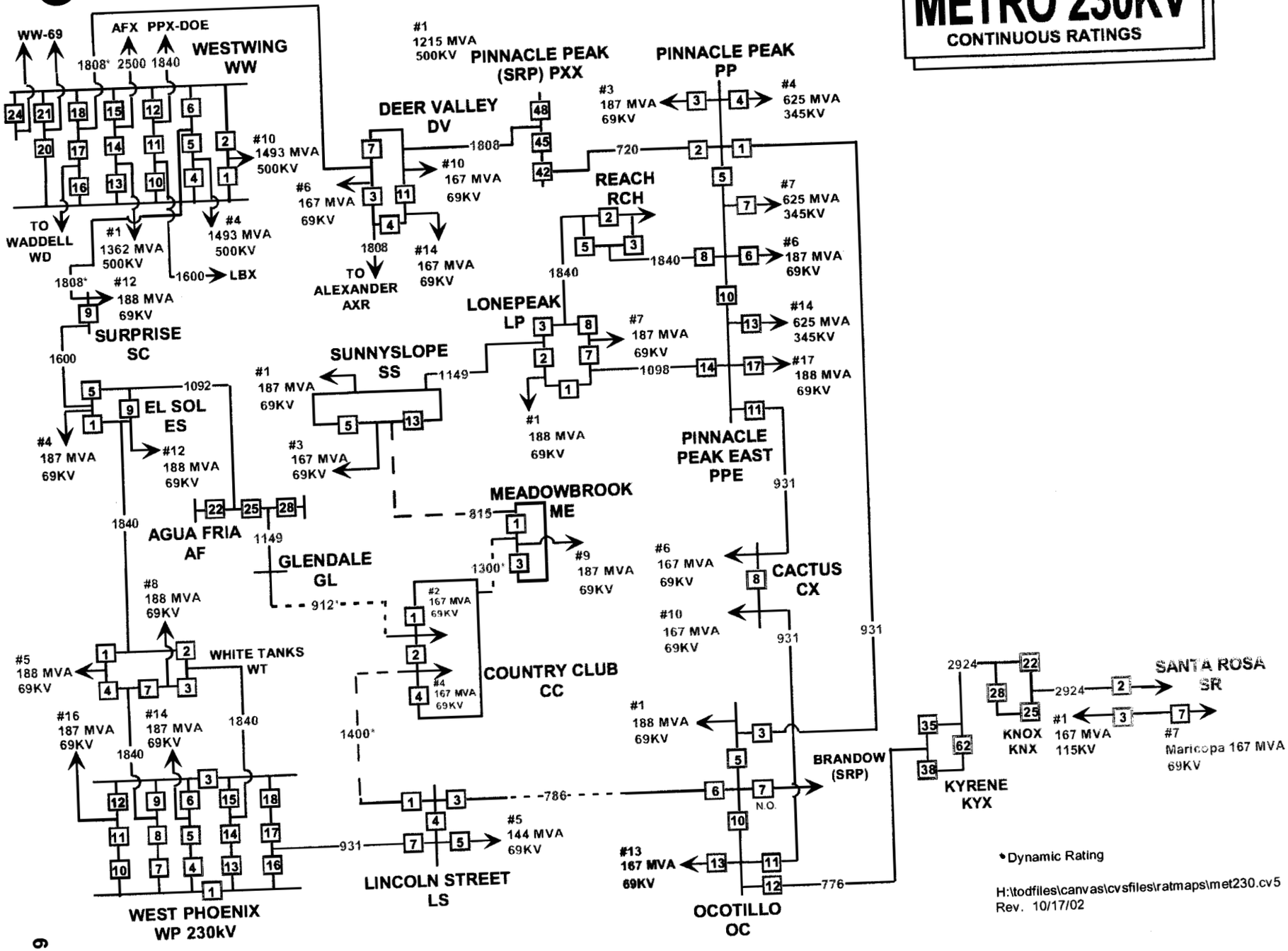

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METRO 230KV
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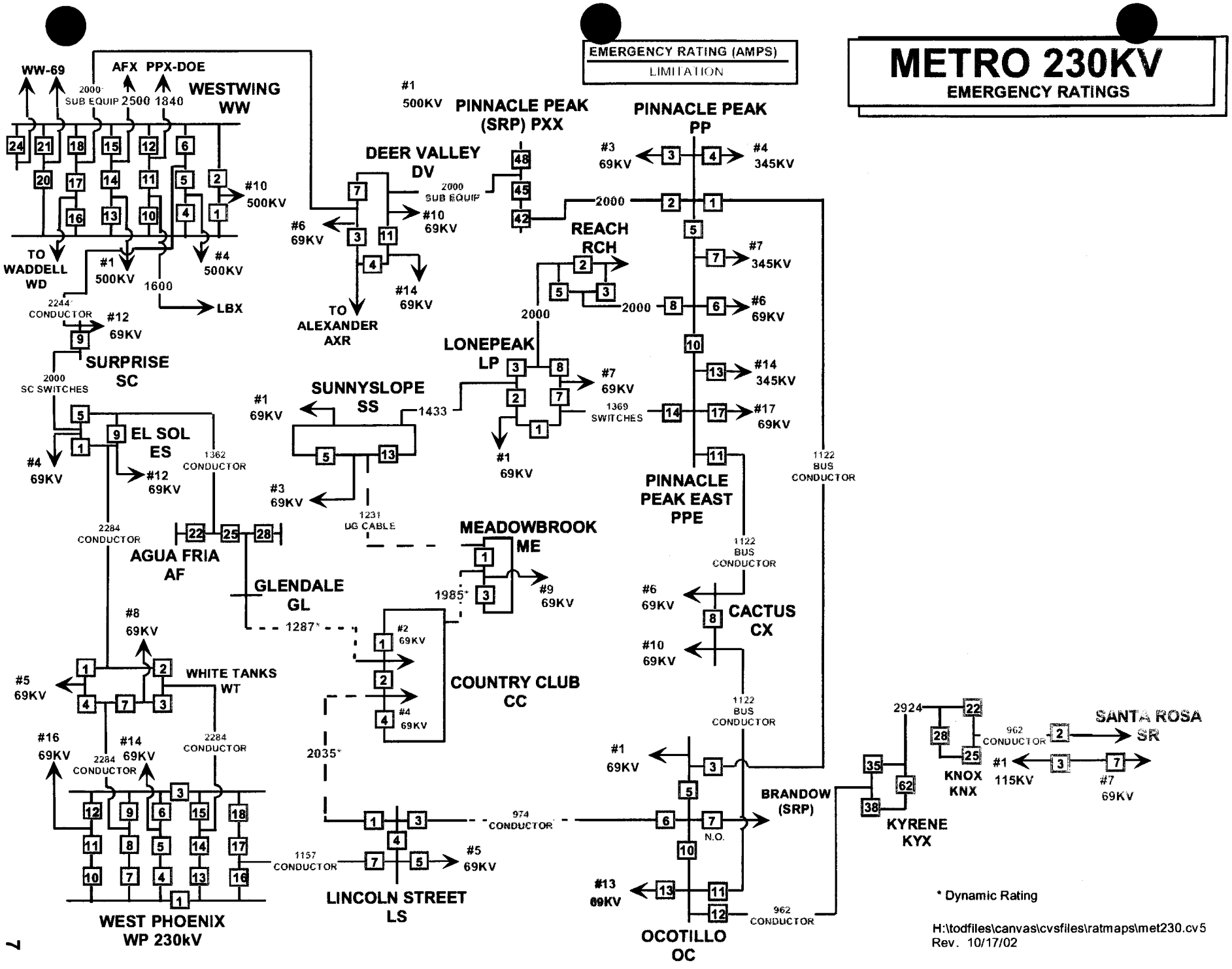

NORTHERN 230KV

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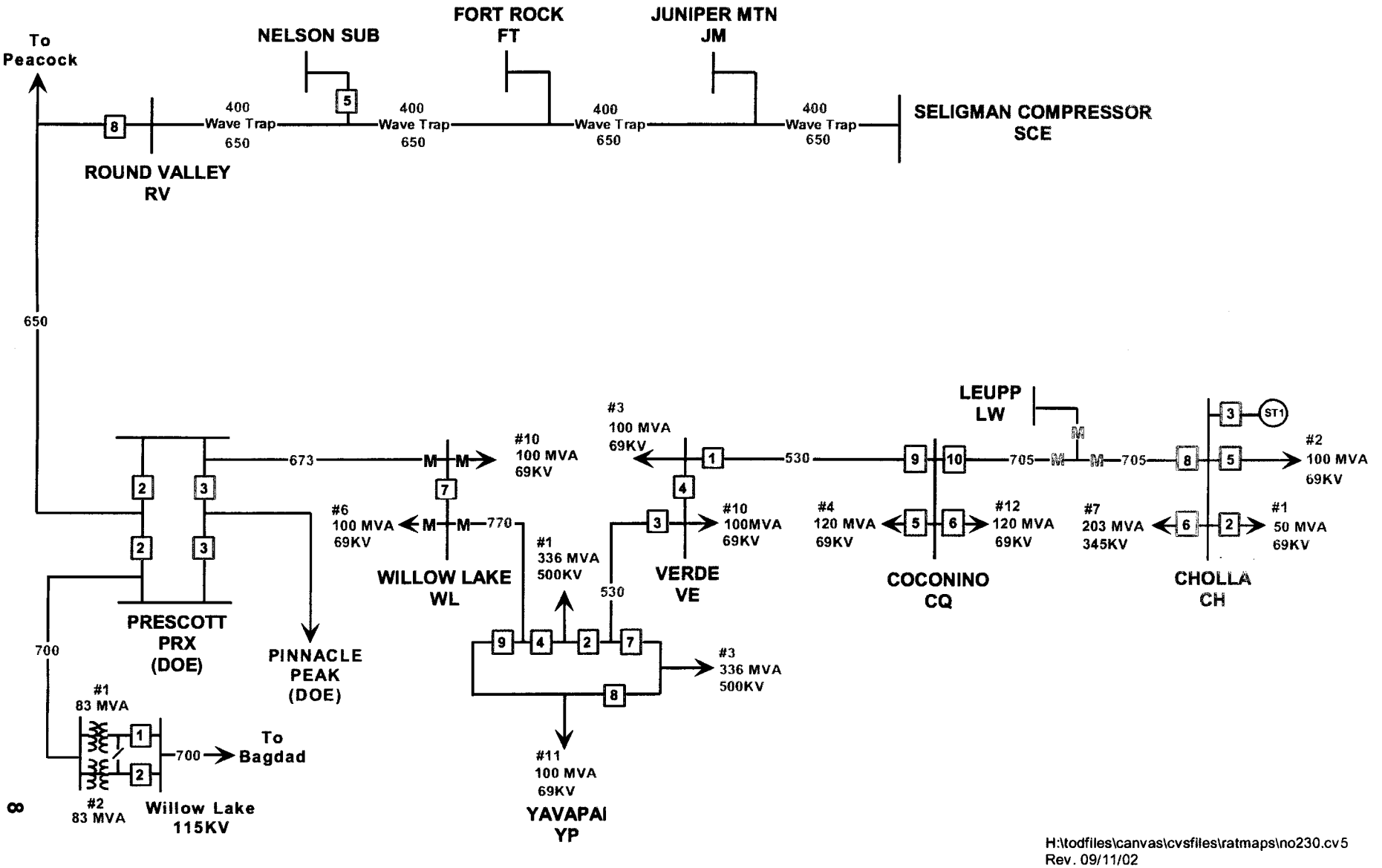

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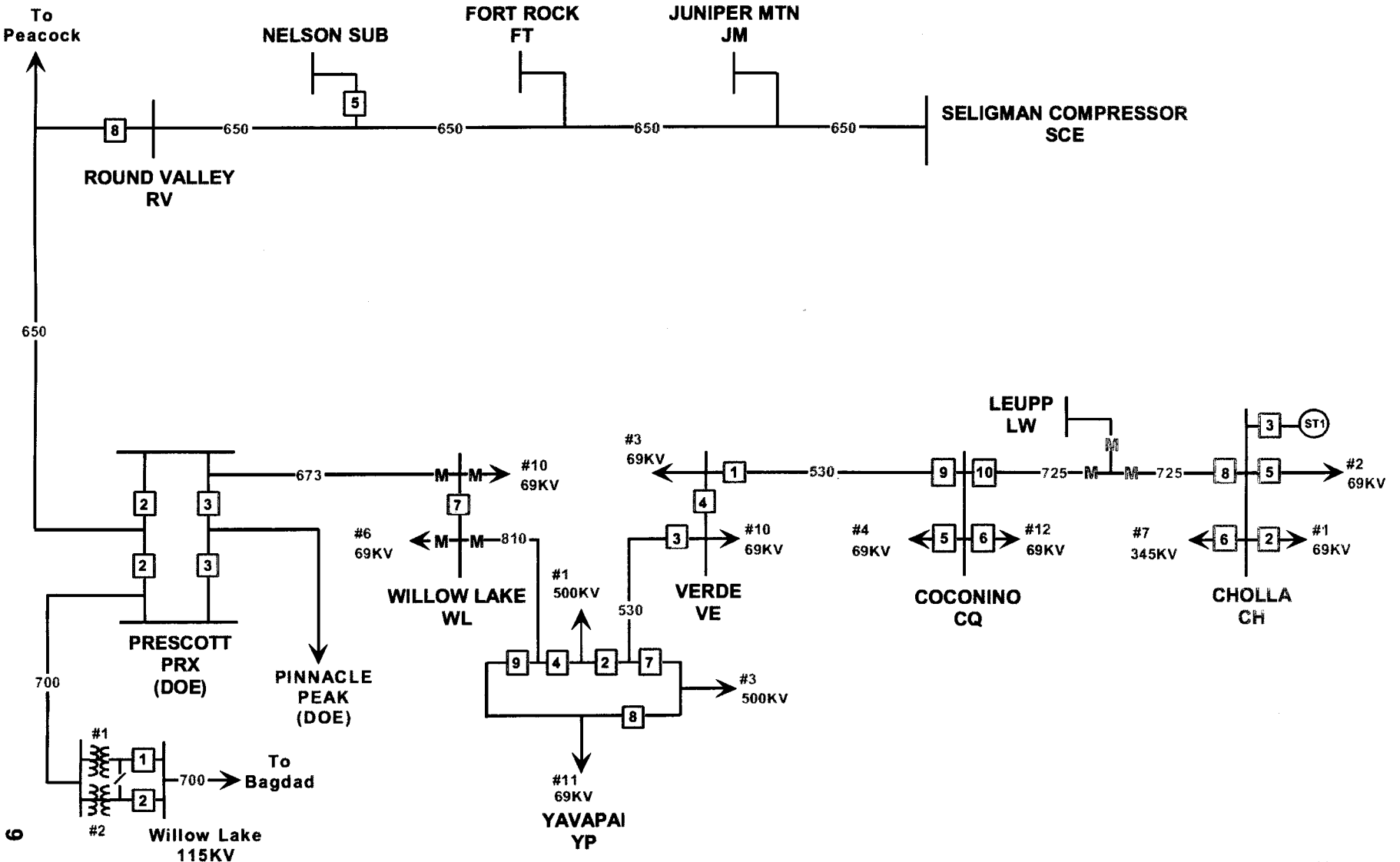
NORTHERN 230KV

EMERGENCY RATINGS

EMERGENCY RATING (AMPS)



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SOUTHERN

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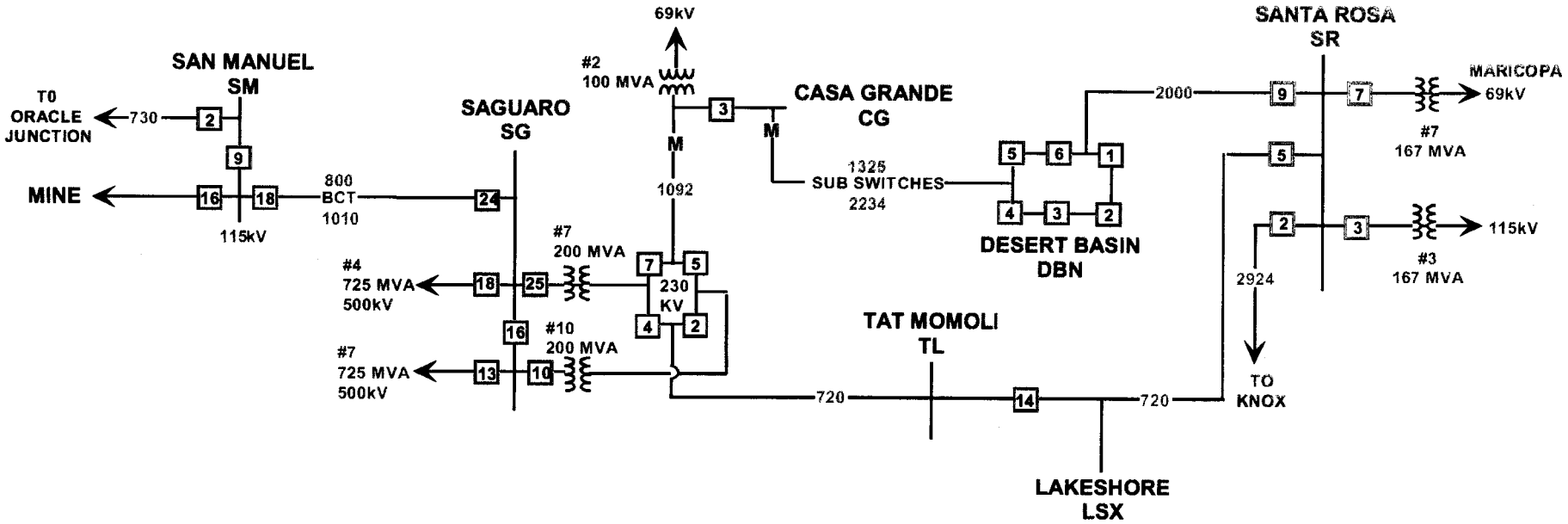

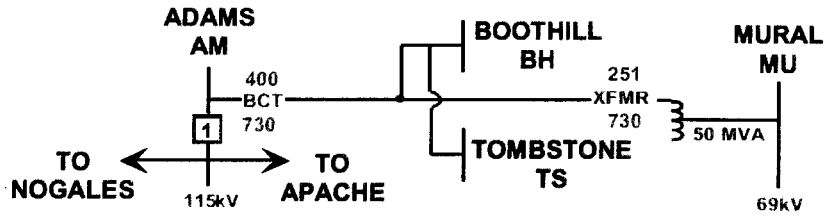

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Rev. 12/05/02

SOUTHERN
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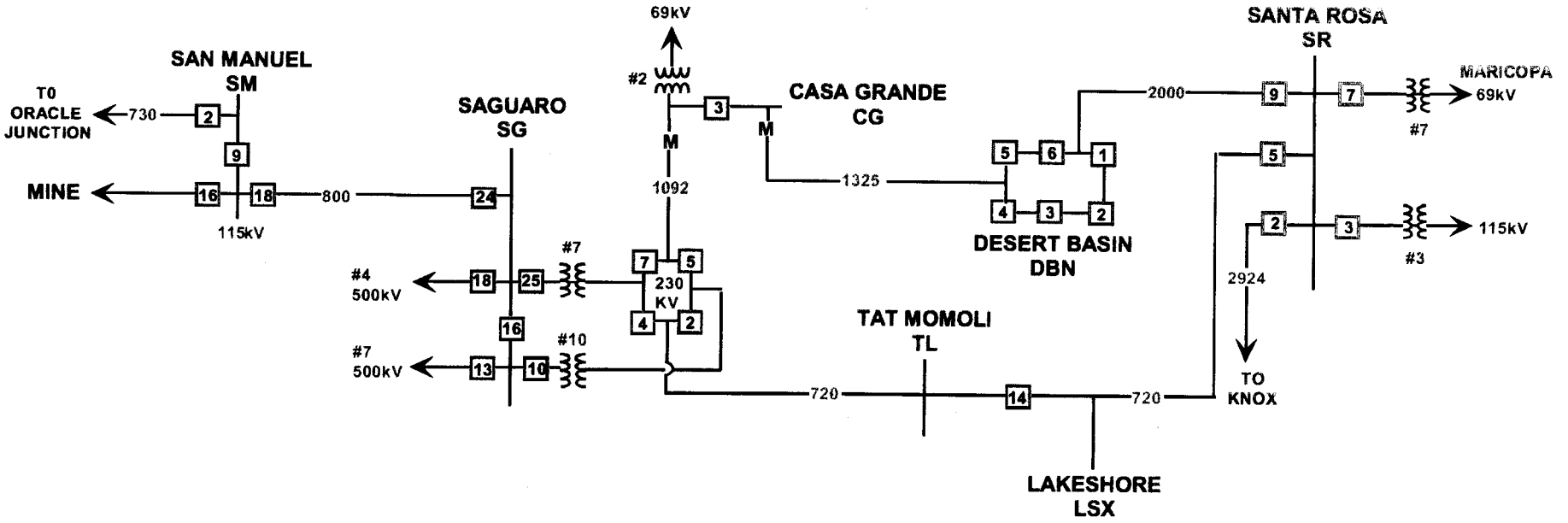

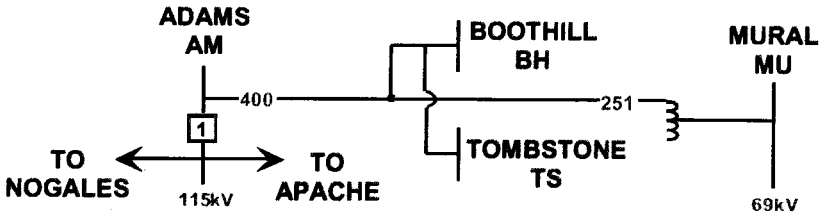

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Rev. 12/05/02

ARIZONA PUBLIC SERVICE COMPANY

TEN-YEAR PLAN

2003 – 2012

TECHNICAL STUDY REPORT

FOR

THE ARIZONA CORPORATION COMMISSION

JANUARY 2003

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ARIZONA PUBLIC SERVICE COMPANY
2003-2012
TEN-YEAR PLAN
TECHNICAL STUDY REPORT

I. Introduction

This technical study report is filed with the ACC pursuant to A.R.S. § 40-360.02, as amended by House Bill 2040, and Arizona Corporation Commission ("Commission") Decision No. 63876 (July 25, 2001) regarding the Biennial Transmission Assessment prepared by Commission Utilities Division Staff.

Two aspects of technical studies were performed and reported here. They are power flow analyses and stability analyses. Power flow analysis was performed for two scenarios. The first is for all transmission system elements being in service. All system elements must be within its continuous rating. The second scenario is for outage of a single element. All remaining system elements must remain within its emergency ratings. Voltage deviations for these scenarios must also be within established guidelines. These voltage deviation guidelines closely approximate post-transient var margin requirements of the Western Systems Coordinating Council. More detail is provided in APS Transmission Planning Process and Guidelines, which is also included in this filing.

The stability analyses were performed to simulate electrical disturbances on the transmission system and evaluate the system response. The desired result is that all generators will remain on line, no additional lines will open and the system oscillations will damp out.

Results of the power flow and stability analyses aid in determining when and where new electrical facilities are needed because of reliability or security reasons. Additionally, some facilities are planned to address adequacy concerns. These include the interconnection of generation to the transmission system or efforts to increase import capability to load-constrained or other areas.

II. Power Flow Analyses

Power flow cases were created for each year of the 2003-2012 study time frame. These cases represent the latest transmission and sub-transmission plans, load projections and resource plans of utilities and independent power producers. Base case and single contingency conditions are evaluated to determine system needs and timing. Various iterations of possible solutions lead to the final plans for transmission additions.

The single contingency analysis involves simulations for every non-radial 115kV or above line that APS owns, partially owns, or operates. Transformer outages are also evaluated. Results of the power flow studies are tabulated in a Security Needs Table and an Adequacy Needs Table, below. These tables identify twenty-six transmission lines

that are included in this Ten-Year Plan filing. Some of the projects were classified as Adequacy Needs because of the uncertainty of generation location, size, and availability in the later years. As projects near the five-year planning time frame, they may be redefined as Security Needs projects. Selected maps of the power flow simulations are contained in the appendix.

Security Needs Table

In Service Year	Critical Outage	Limiting Element	Transmission Project
2003	Jojoba-Kyrene 500kV line	Voltage deviation @ Kyrene	Palo Verde-Rudd 500kV line
2004	Jomax-Dove Valley 69kV line	Voltage deviation @ Dove Valley 69kV & load loss @ Gavilan Peak 69kV and Dove Valley 69kV.	Loop-in of Pinnacle Peak-Prescott 230kV line to Gavilan Peak 230kV substation
2006	White Tanks 230/69kV transformer or local 69kV lines	White Tanks 230/69kV xfmr #2 & voltage deviation @ White Tanks & 69kV system busses	Rudd-TS3 230kV line & Liberty-TS3 230kV
2006	Cholla-Coconino 230kV line	Yavapai-Verde 230kv line and voltage deviation @ No. AZ	Loop-in of Cholla-Coconino 230kV line to Flagstaff 230kV substation. Flagstaff 345/230kV transformer
2006	Liberty-Buckeye 230kV line	Voltage deviation @ Buckeye & 69kV system lines. Gila Bend transformer	Loop-in of Liberty-Gila Bend 230kV line to Buckeye 230kV substation.
2008	Loss of Surprise 230/69kV transformer or loss of Westwing 230/69kV transformer or local 69kV lines	Surprise 230/69kV transformer, Westwing 230/69kV transformer, and local 69kV lines	Trilby Wash-TS2-TS3 230kV lines
2008	Raceway transformer & local 69kV lines	Voltage deviation @ Avery & 69kV system lines	Raceway-Avery 230kV line
2009	Raceway-Avery 230kV line	230/69kV transformers @ Deer Valley, Gavilan Peak, and Pinnacle Peak and voltage deviation @ Avery	Pinnacle Peak-Misty Willow-Avery 230kV line
2010	Palo Verde-N. Gila 500kV line	Voltage deviation @ Yuma & scheduling capacity	Gila Bend-Yuma 230kV line

Adequacy Needs Table

In Service Year	Transmission Project	System Benefits
2006	Loop-in of Jojoba-Kyrene 500kV to Rudd 500kV substation	Increase import capability to the Phoenix metropolitan area
2006	Hassayampa-Pinal West-S.E. Valley 500kV line	Increases import capability for the Phoenix metropolitan area, increases the export capability from the PV area
2006	Santa Rosa-Pinal West 230kV line	Increase transmission system reliability and ability to deliver power
2007	Loop-in of Cholla-Saguaro 500kV line into Silver King 500kV substation	Increase transmission system reliability and ability to deliver power. Increases import capability for the Phoenix metropolitan area.
2008	Palo Verde-TS5 500kV, TS5-Trilby Wash 230kV	Increases import capability for the Phoenix metropolitan area, increases the export capability from the PV area. Increase system reliability and ability to deliver power.
2009	Cholla-Second Knoll 230kV	Increase transmission system reliability and ability to deliver power
2009-2010	Loop-in of Navajo-Westwing 500kV to Table Mesa 500kV substation, TS5-Table Mesa 500kV; Loop-in of Gavilan Peak-Prescott 230kV to Table Mesa 230kV substation, Table Mesa-Raceway 230kV	Increases import capability for the Phoenix metropolitan area, increases the export capability from the PV area. Increase system reliability and ability to deliver power.
2010	Westwing-Raceway 230kV line #2	Increase reliability to Raceway and provide a backup for outage of Westwing 500/230kV transformers
2012	Gila Bend-Pinal West 230kV line	Increase transmission system reliability and ability to deliver power
2012	Westwing-El Sol 230kV line	Increase transmission system reliability and ability to deliver power
2012	Gila Bend-Pinal West 230kV line	Increase transmission system reliability and ability to deliver power
2012	Loop-in of Cholla-Pinnacle Peak 345kV to Matazal 345kV substation	Increase transmission system reliability and ability to deliver power
TBD	Palo Verde-Pinal West-Saguaro	Increase transmission system reliability and ability to deliver power

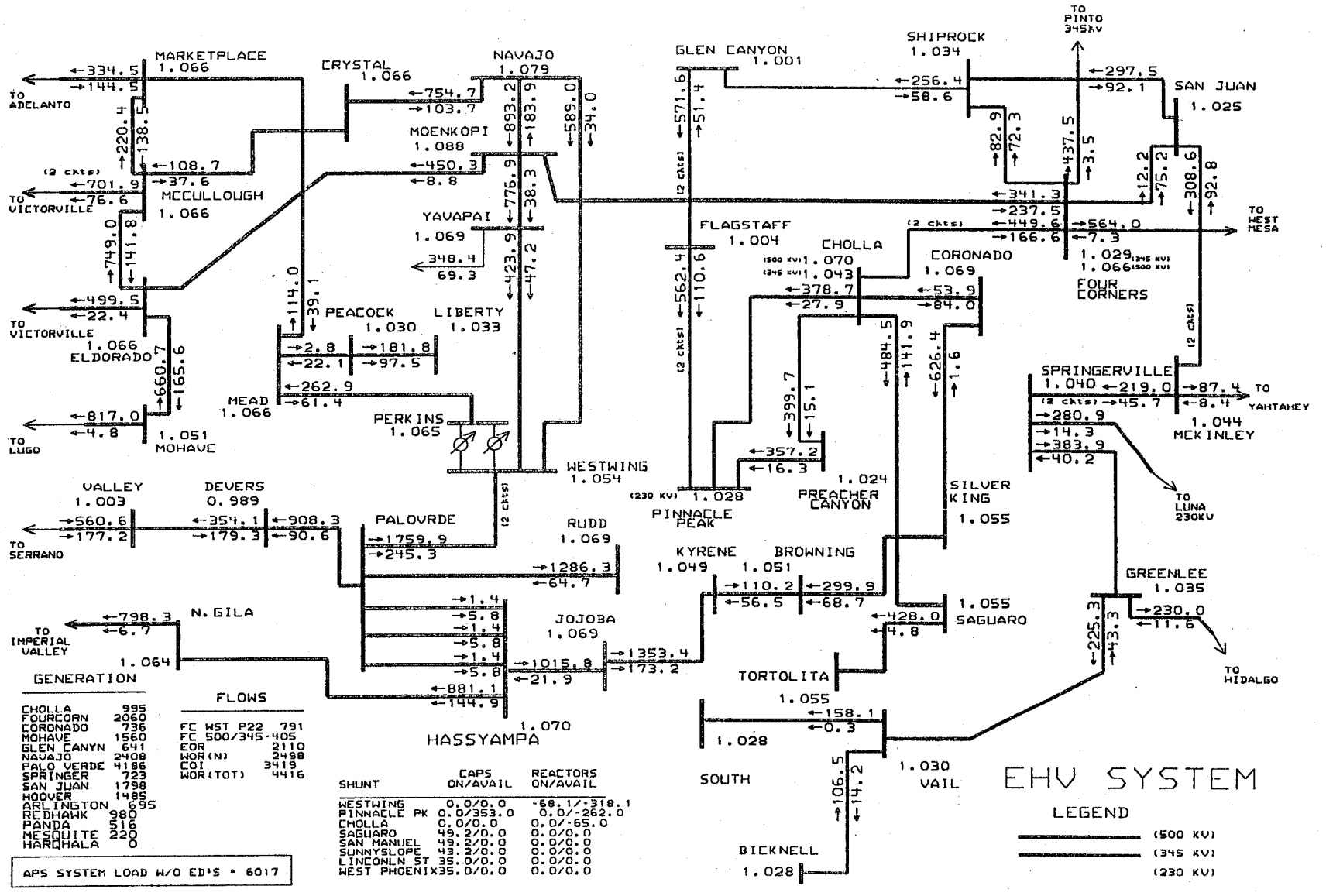
III. Stability Analysis

A stability simulation for simulated three-phase faults was performed for 2003 and 2010 for every 345kV or 500kV line that APS owns (totally or partially) or operates. It has been APS' experience that stability concerns do not manifest on the 230kV system, which is primarily designed to deliver power to load. Therefore, no 230kV simulations were performed. Additionally, every new proposed generation plant will be required to perform stability evaluations prior to receiving permission to interconnect to the transmission system.

Each simulation modeled a 3-phase bus fault, appropriate series capacitor flashing and reinsertion, and fault removal and transmission line removal. System performance was evaluated by monitoring representative generator rotor angles, bus voltages and system frequency. Plots of these system parameters are included in Appendix B. The stability simulations performed to date indicate that no stability problems limit the transmission system.

APPENDIX A

Power Flow Maps



GENERATION

CHOLLA	995
FOURCORN	2060
CORONADO	736
MOHAVE	1560
GLEN CANYN	641
NAVAJO	2408
PALO VERDE	4186
SPRINGER	723
SAN JUAN	1798
HOOVER	1485
ARLINGTON	695
REDHAWK	980
PANDA	516
MESQUITE	220
HARQHALA	0

FLOWS

FC WST P22	791
FC 500/345	-405
EOR	2110
WOR(N)	2498
COI	3419
WOR(TOT)	4416

APS SYSTEM LOAD W/O ED'S = 6017

SHUNT	CAPS ON/AVAIL	REACTORS ON/AVAIL
WESTWING	0.0/0.0	-68.1/-318.1
PINNACLE PK	0.0/353.0	0.0/-262.0
CHOLLA	0.0/0.0	0.0/-65.0
SAGUARO	49.2/0.0	0.0/0.0
SAN MANUEL	49.2/0.0	0.0/0.0
SUNNYSLOPE	43.2/0.0	0.0/0.0
LINCONLN ST	35.0/0.0	0.0/0.0
WEST PHOENIX	35.0/0.0	0.0/0.0

General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:29:32 2003

APS Transmission Planning

APS 2003 PLANNING CASE
WECC 2003 HS3-SA APPROVED BASE CASE
2003

BASECASE N-0

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sm03s28a.wrk
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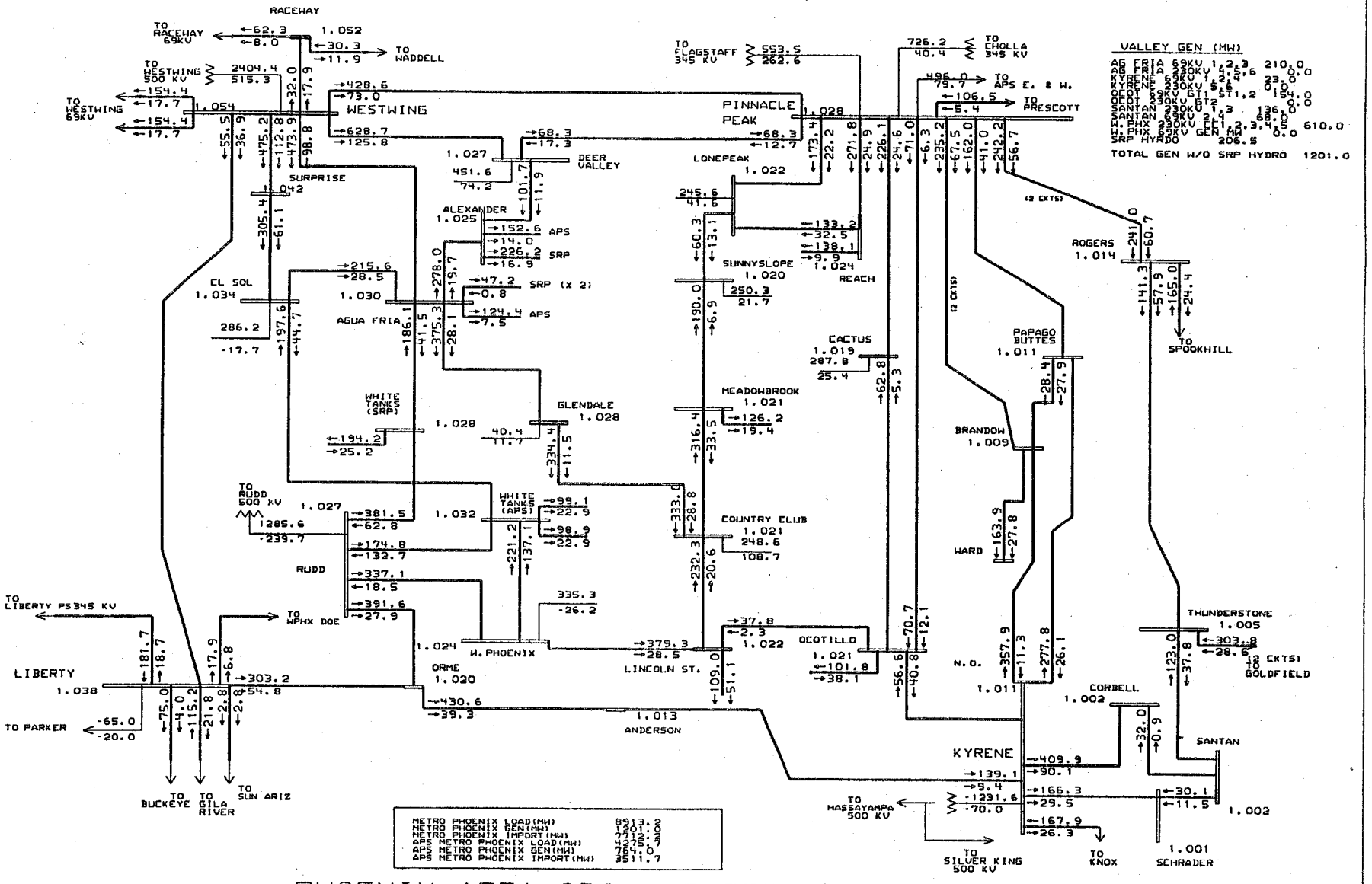

PHOENIX AREA 230KV SYSTEM

A2

General Electric International, Inc. PSLF Program

MW/MVAR Tue Jan 21 07:29:25 2003

APS 2003 PLANNING CASE
WECC 2003 HS3-SA APPROVED BASE CASE
2003

BASECASE N-0

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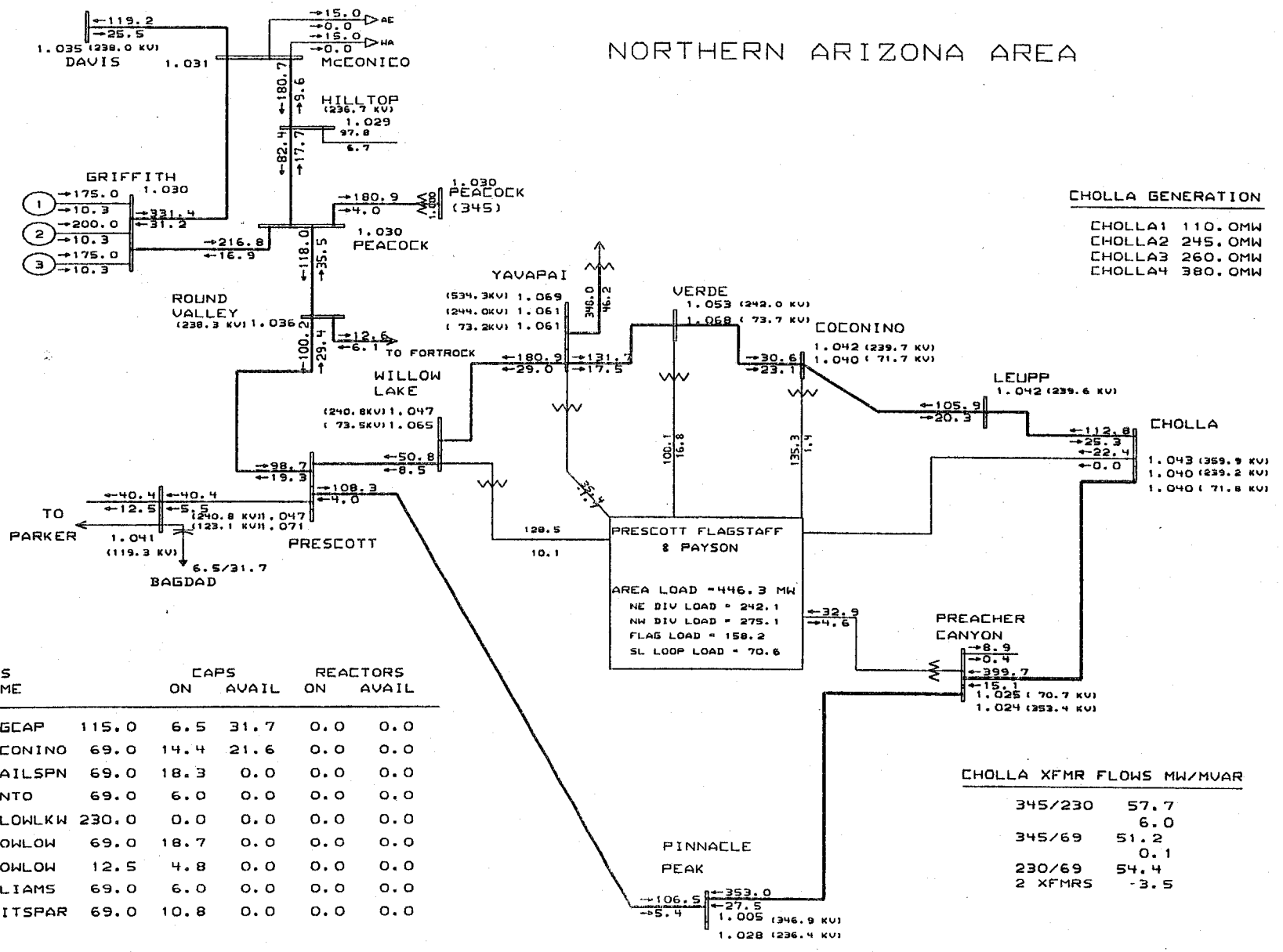
NORTHERN ARIZONA AREA



CHOLLA GENERATION

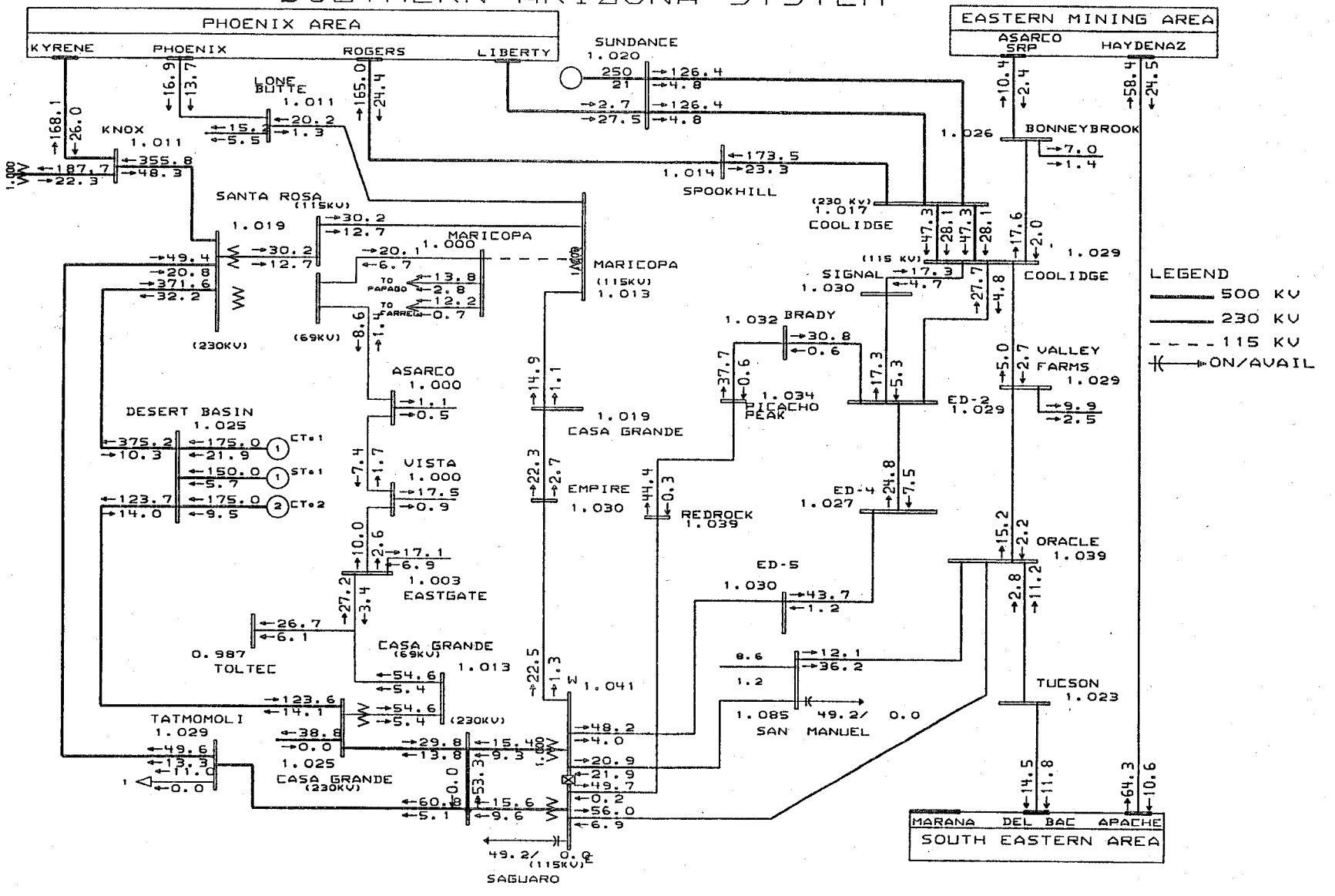
CHOLLA1	110.0MW
CHOLLA2	245.0MW
CHOLLA3	260.0MW
CHOLLA4	380.0MW

CHOLLA XFMR FLOWS MW/MVAR

345/230	57.7
	6.0
345/69	51.2
	0.1
230/69	54.4
2 XFMRS	-3.5

BUS NAME		CAPS ON	CAPS AVAIL	REACTORS ON	REACTORS AVAIL
BAGCAP	115.0	6.5	31.7	0.0	0.0
COCONINO	69.0	14.4	21.6	0.0	0.0
QUAILSPN	69.0	18.3	0.0	0.0	0.0
TONTO	69.0	6.0	0.0	0.0	0.0
WILOWLKW	230.0	0.0	0.0	0.0	0.0
SHOWLOW	69.0	18.7	0.0	0.0	0.0
SHOWLOW	12.5	4.8	0.0	0.0	0.0
WILIAMS	69.0	6.0	0.0	0.0	0.0
WHITSPAR	69.0	10.8	0.0	0.0	0.0

SOUTHERN ARIZONA SYSTEM



General Electric International, Inc. PSLF Program

Transmission Planning

APS 2003 PLANNING CASE
WECC 2003 HS3-SA APPROVED BASE CASE
2003

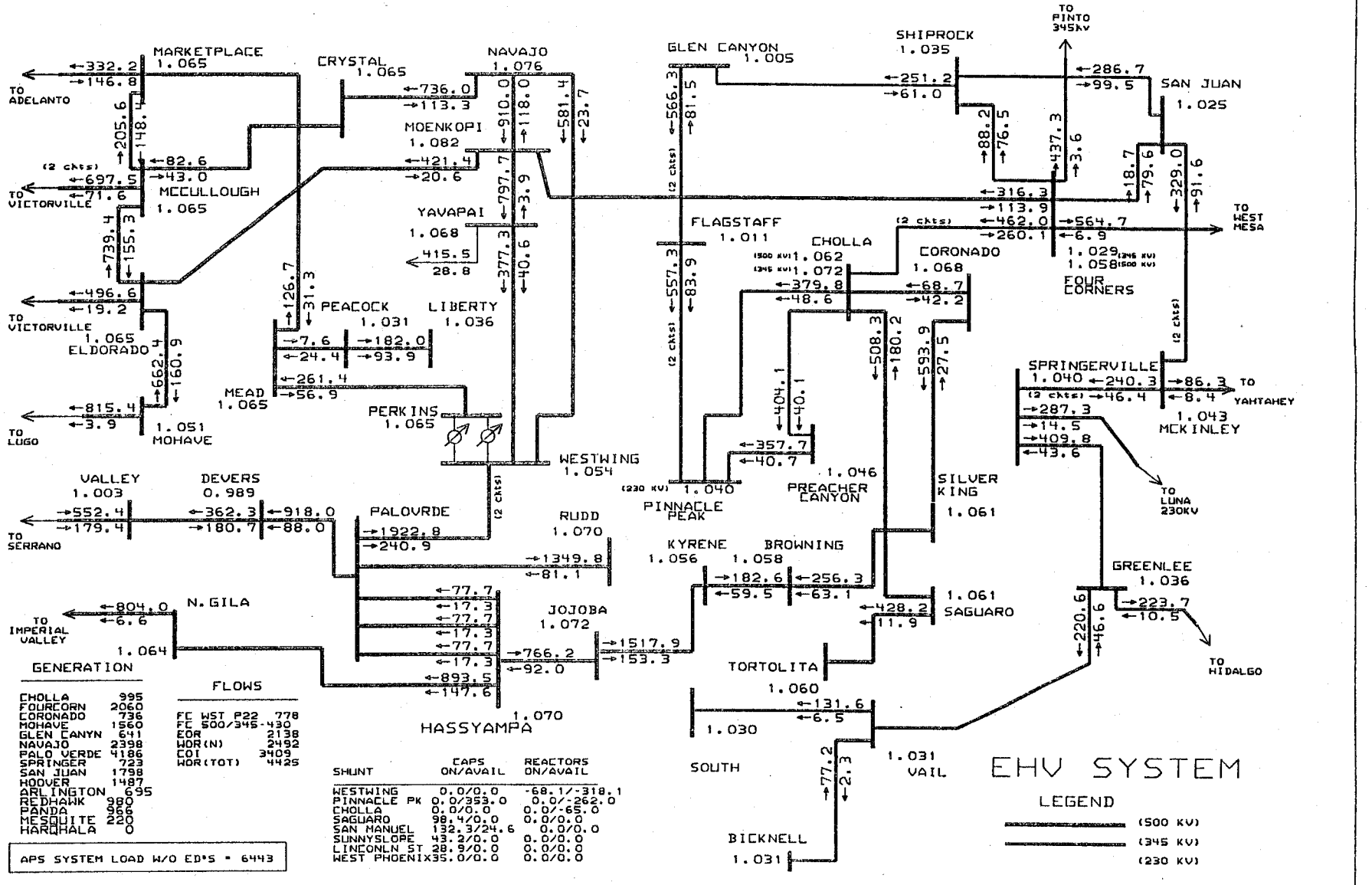
BASECASE N-0

MW/MVAR

Tue Jan 21 07:29:05 2003

so230_03.drw
sm03:28a.wrk
Rating = 2

44



GENERATION

CHOLLA	995
FOURCORN	2060
CORONADO	736
MOHAVE	1560
GLEN CANYN	641
NAVAJO	2398
PALO VERDE	4186
SPRINGER	723
SAN JUAN	1798
HOOVER	1487
ARLINGTON	695
REDHAWK	980
PANDA	966
MESQUITE	220
HARQHALA	0

FLOWS

FC WST P22	778
FC 500/345	-430
EOR	2138
WOR(N)	2492
COI	3409
WOR(TOT)	4425

APS SYSTEM LOAD W/O ED'S = 6443

SHUNT	CAPS ON/AVAIL	REACTORS ON/AVAIL
WESTWING	0.0/0.0	-68.1/-318.1
PINNACLE PK	0.0/353.0	0.0/-262.0
CHOLLA	0.0/0.0	0.0/-65.0
SAGUARO	98.4/0.0	0.0/0.0
SAN MANUEL	132.3/24.6	0.0/0.0
SUNNYSLOPE	43.2/0.0	0.0/0.0
LINCONLN ST	28.9/0.0	0.0/0.0
WEST PHOENIX	35.0/0.0	0.0/0.0

General Electric International, Inc. | PSLF Program | MW/MVAR | Tue Jan 21 07:30:04 2003

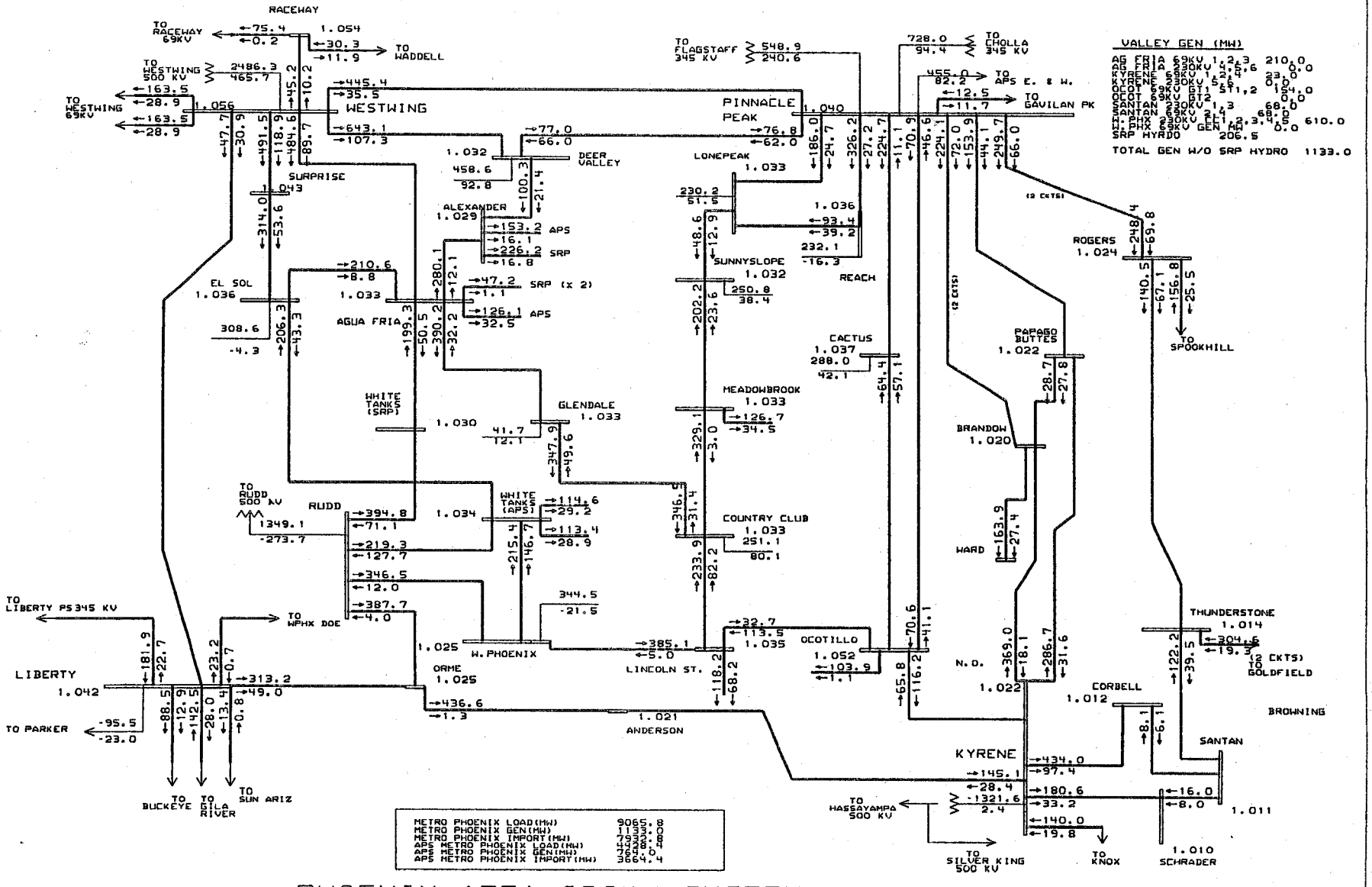
APS Transmission Planning

APS 2004 PLANNING CASE
WECC 2003 HS3-SA APPROVED BASE CASE
2004

BASECASE N-0

ehv_04.drw
sw04123a.wrk
Rating = 2

45



PHOENIX AREA 230KV SYSTEM

A16

General Electric International, Inc. PSLF Program

Transmission Planning

APS 2004 PLANNING CASE
WECC 2003 HS3-SA APPROVED BASE CASE
2004

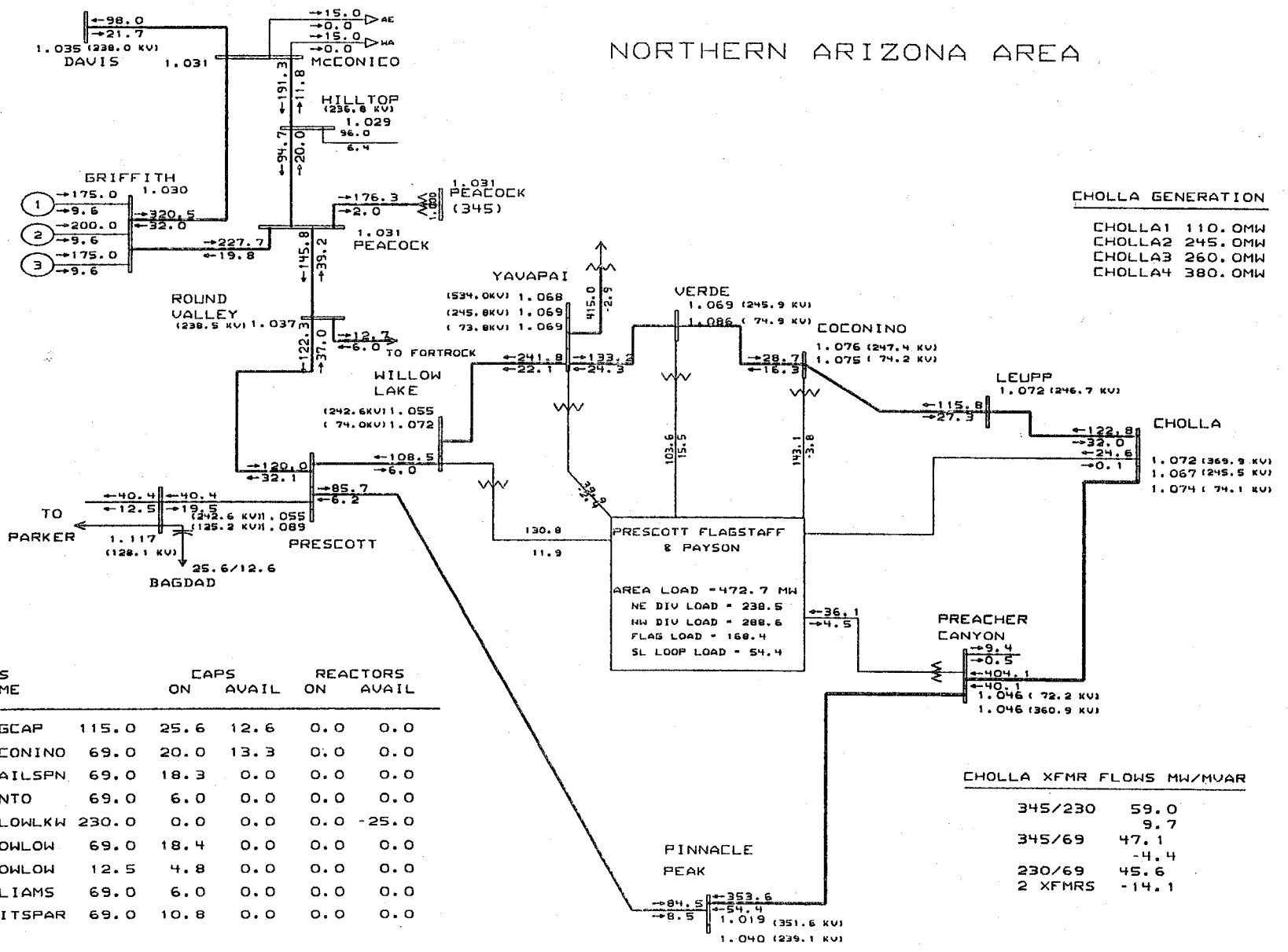
BASECASE N-0

MW/MVAR

Tue Jan 21 07:30:06 2003

met230_04.drw
sm04s23a.wrk
Rating = 2

NORTHERN ARIZONA AREA



CHOLLA GENERATION

CHOLLA1	110.0MW
CHOLLA2	245.0MW
CHOLLA3	260.0MW
CHOLLA4	380.0MW

BUS NAME		CAPS ON	CAPS AVAIL	REACTORS ON	REACTORS AVAIL
BAGCAP	115.0	25.6	12.6	0.0	0.0
COCONINO	69.0	20.0	13.3	0.0	0.0
QUAILSPN	69.0	18.3	0.0	0.0	0.0
TONTO	69.0	6.0	0.0	0.0	0.0
WILOWLKW	230.0	0.0	0.0	0.0	-25.0
SHOWLOW	69.0	18.4	0.0	0.0	0.0
SHOWLOW	12.5	4.8	0.0	0.0	0.0
WILIAMS	69.0	6.0	0.0	0.0	0.0
WHITSPAR	69.0	10.8	0.0	0.0	0.0

CHOLLA XFMR FLOWS MW/MVAR

345/230	59.0
	9.7
345/69	47.1
	-4.4
230/69	45.6
2 XFMRS	-14.1

47

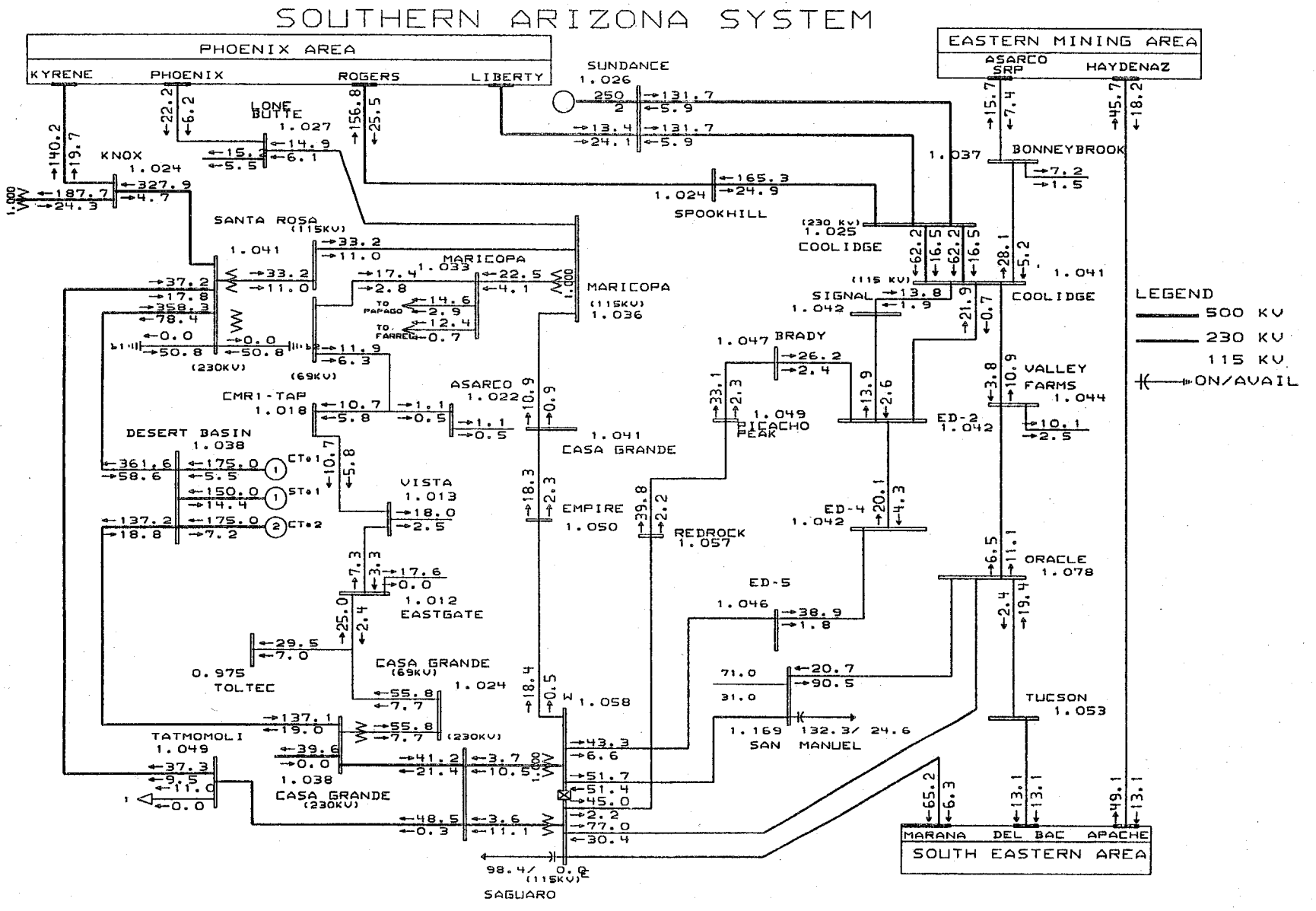
General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:30:12 2003

APS Transmission Planning

APS 2004 PLANNING CASE
WECC 2003 HS3-SA APPROVED BASE CASE
2004

BASECASE N-0

no230_04.drw
sm04i23a.wrk
Rating = 2



General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:30:17 2003

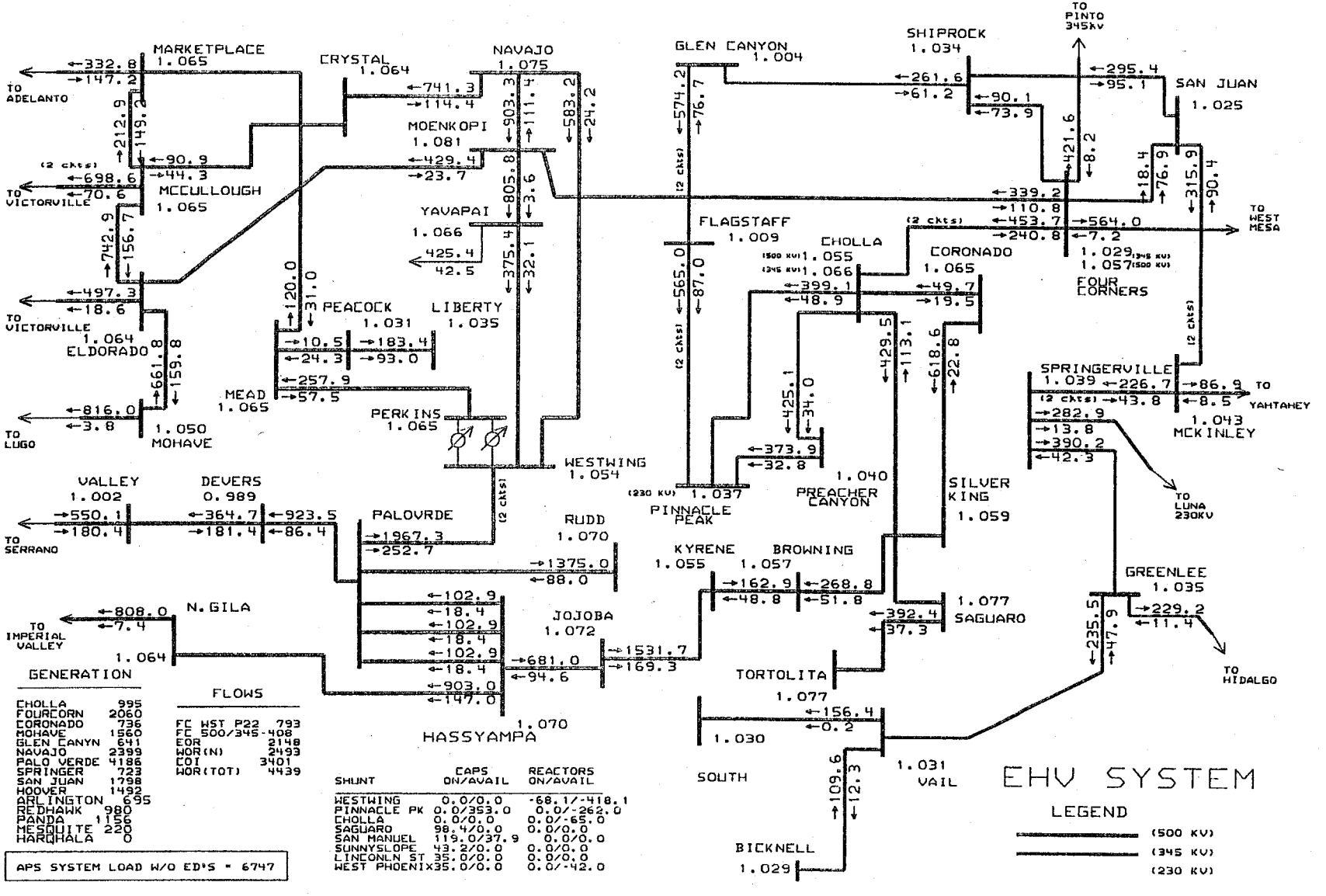
Transmission Planning

APS 2004 PLANNING CASE
WECC 2003 HS3-SA APPROVED BASE CASE
2004

BASECASE N-0

so230_04.drw
sm04s23a.wrk
Rating = 2

A8



GENERATION

CHOLLA	995
FOURCORN	2060
CORONADO	736
MOHAVE	1560
GLEN CANYN	641
NAVAJO	2399
PALO VERDE	4186
SPRINGER	723
SAN JUAN	1798
HOOVER	1492
ARLINGTON	695
REDHAWK	980
PANDA	1156
MESQUITE	220
HARQHALA	0

FLOWS

FC WST P22	793
FC 500/345	408
EOR	2148
WOR(N)	2493
COI	3401
WOR(TOT)	4439

APS SYSTEM LOAD W/O ED'S = 6747

SHUNT	CAPS ON/AVAIL	REACTORS ON/AVAIL
WESTWING	0.0/0.0	-68.1/-418.1
PINNACLE PK	0.0/353.0	0.0/-262.0
CHOLLA	0.0/0.0	0.0/-65.0
SAGUARO	88.4/0.0	0.0/0.0
SAN MANUEL	119.0/37.9	0.0/0.0
SUNNYSLOPE	43.2/0.0	0.0/0.0
LINCONLN ST	35.0/0.0	0.0/0.0
WEST PHOENIX	35.0/0.0	0.0/-42.0

49

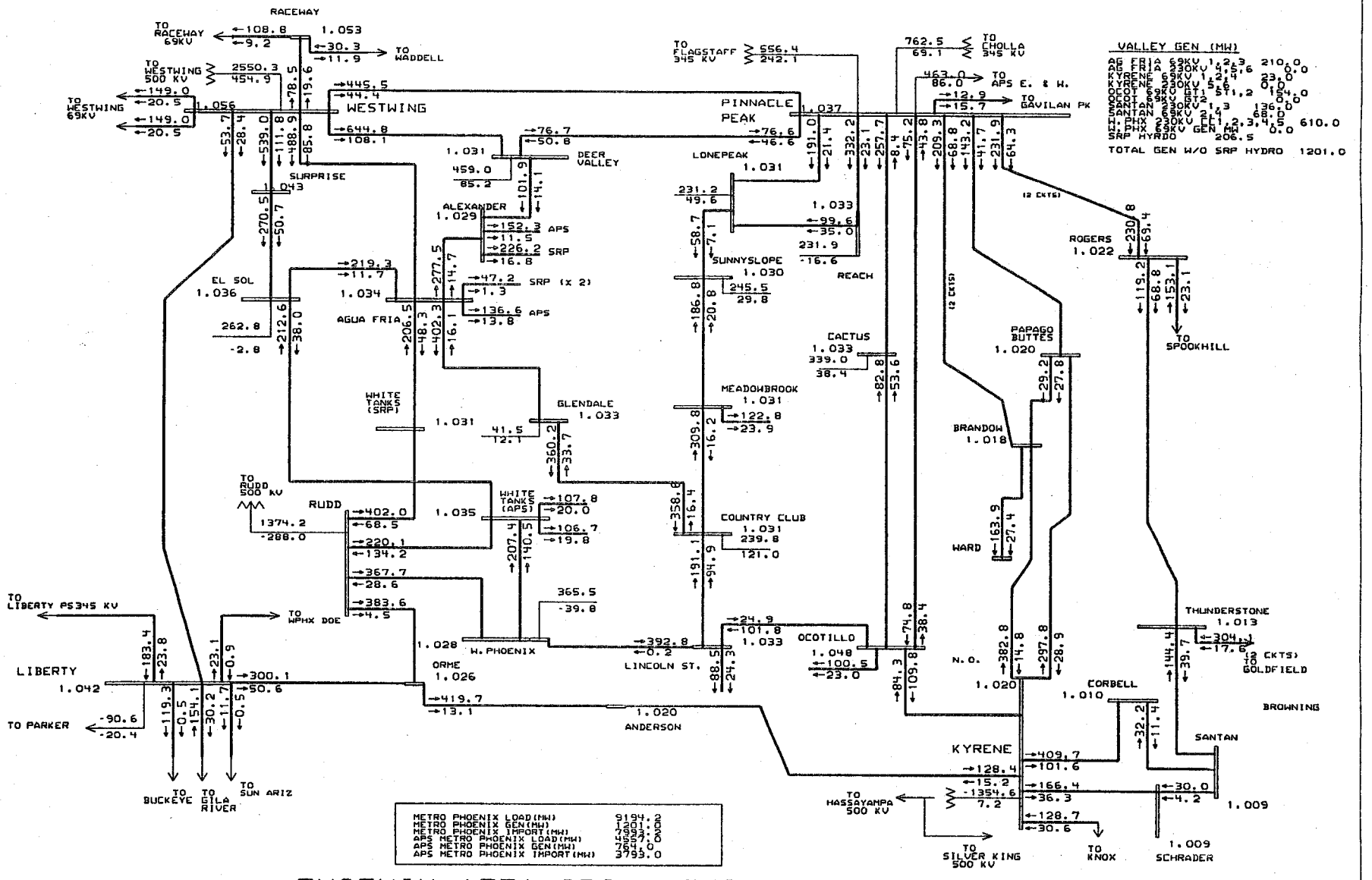
General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:30:38 2003

APS Transmission Planning

APS 2004 PLANNING CASE
WECC 2003 HS3-SA APPROVED BASE CASE
2005

BASECASE N-0

ehv_05.drw
sm05s24a.wrk
Rating = 2



PHOENIX AREA 230KV SYSTEM

General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:30:41 2003

smission ning

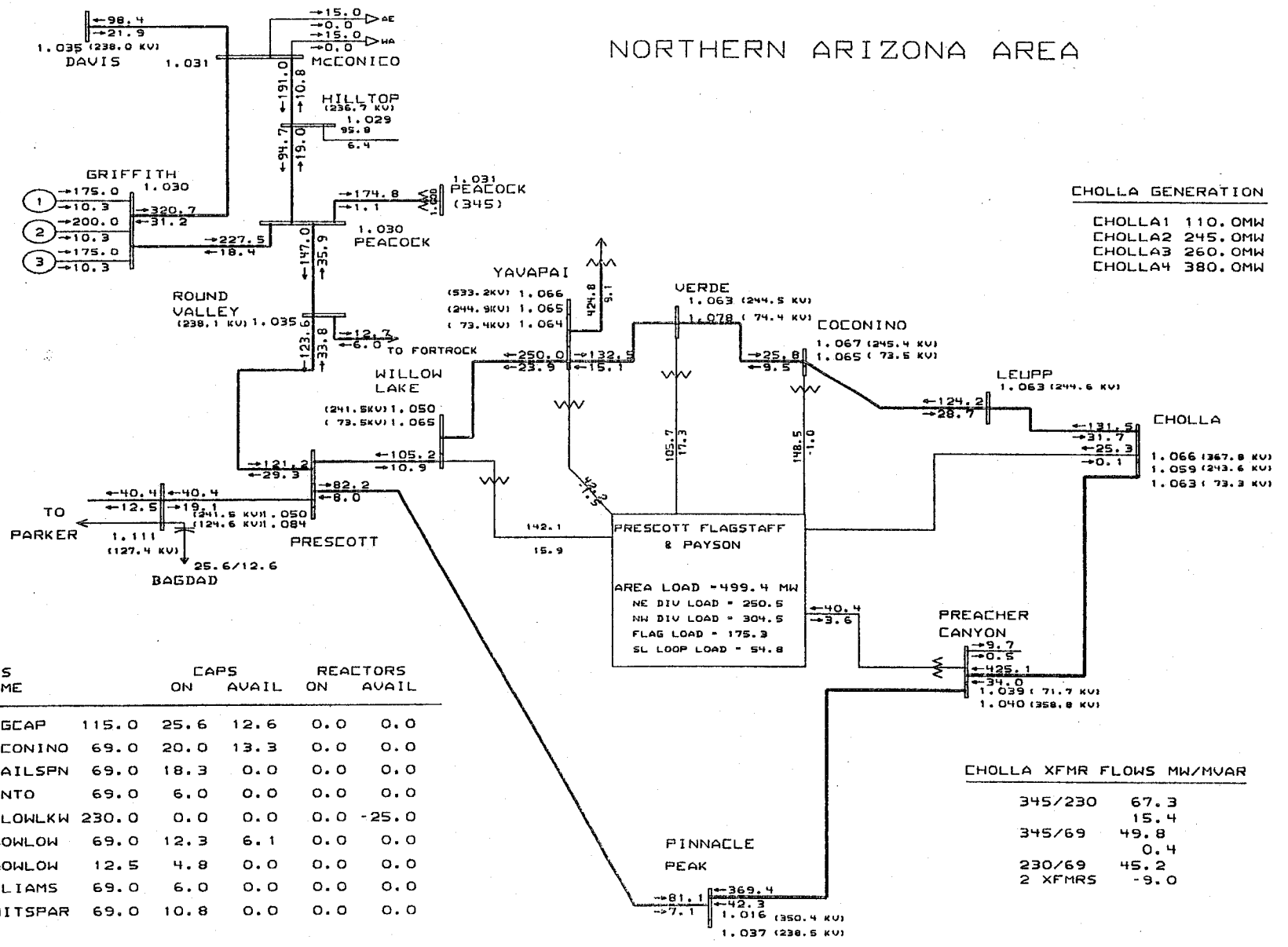
APS 2004 PLANNING CASE
WECC 2003 HS3-SA APPROVED BASE CASE
2005

BASECASE N-0

met230_05.drw
sm05*24a.wrk
Rating = 2

A10

NORTHERN ARIZONA AREA



CHOLLA GENERATION

CHOLLA1	110.0MW
CHOLLA2	245.0MW
CHOLLA3	260.0MW
CHOLLA4	380.0MW

CHOLLA XFMR FLOWS MW/MVAR

345/230	67.3
	15.4
345/69	49.8
	0.4
230/69	45.2
2 XFMRS	-9.0

BUS NAME		CAPS ON	CAPS AVAIL	REACTORS ON	REACTORS AVAIL
BAGCAP	115.0	25.6	12.6	0.0	0.0
COCONINO	69.0	20.0	13.3	0.0	0.0
QUAILSPN	69.0	18.3	0.0	0.0	0.0
TONTO	69.0	6.0	0.0	0.0	0.0
WILOWLKW	230.0	0.0	0.0	0.0	-25.0
SHOWLOW	69.0	12.3	6.1	0.0	0.0
SHOWLOW	12.5	4.8	0.0	0.0	0.0
WILIAMS	69.0	6.0	0.0	0.0	0.0
WHITSPAR	69.0	10.8	0.0	0.0	0.0

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General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:30:46 2003

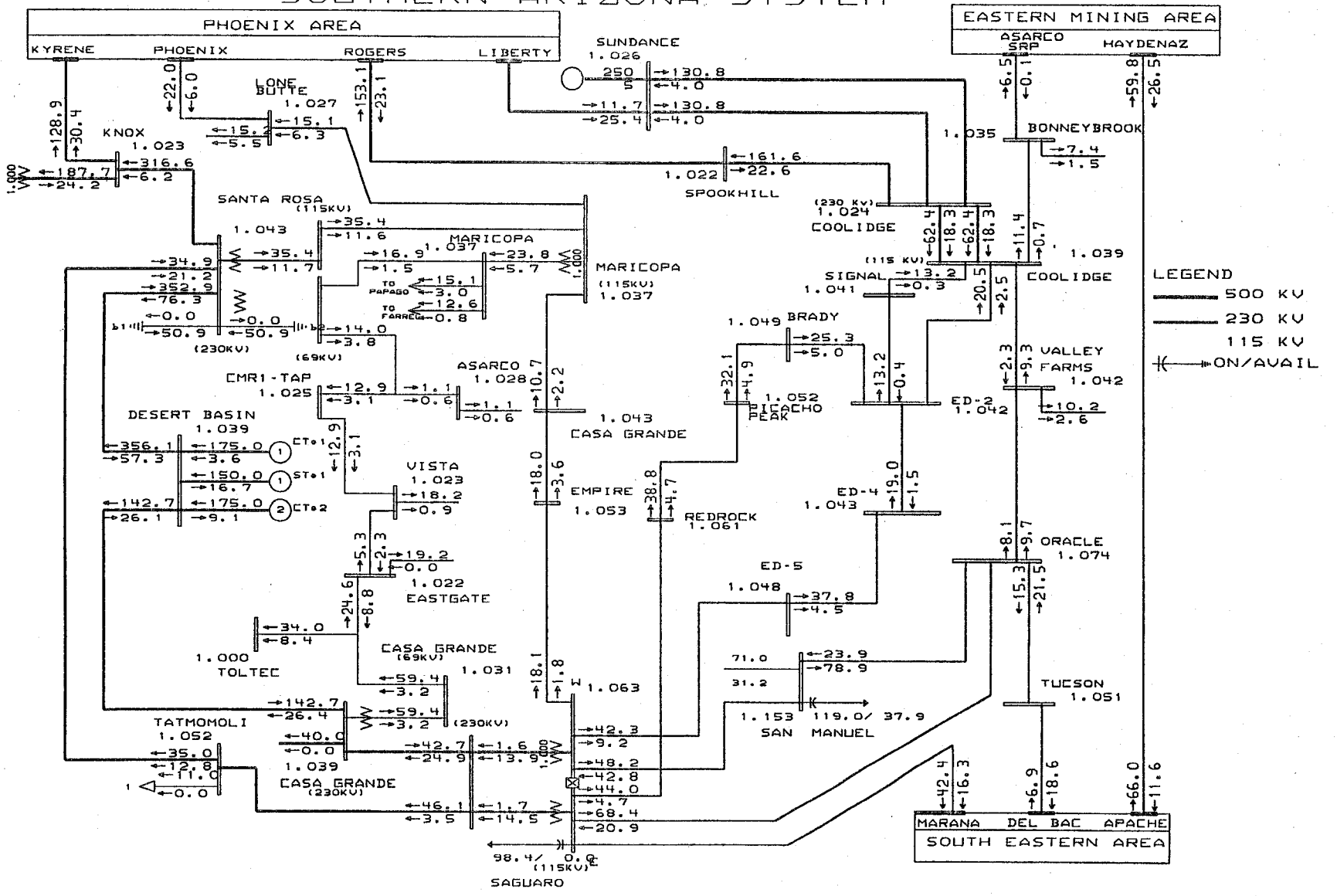
APS Transmission Planning

APS 2004 PLANNING CASE
WECC 2003 HS3-SA APPROVED BASE CASE
2005

BASECASE N-0

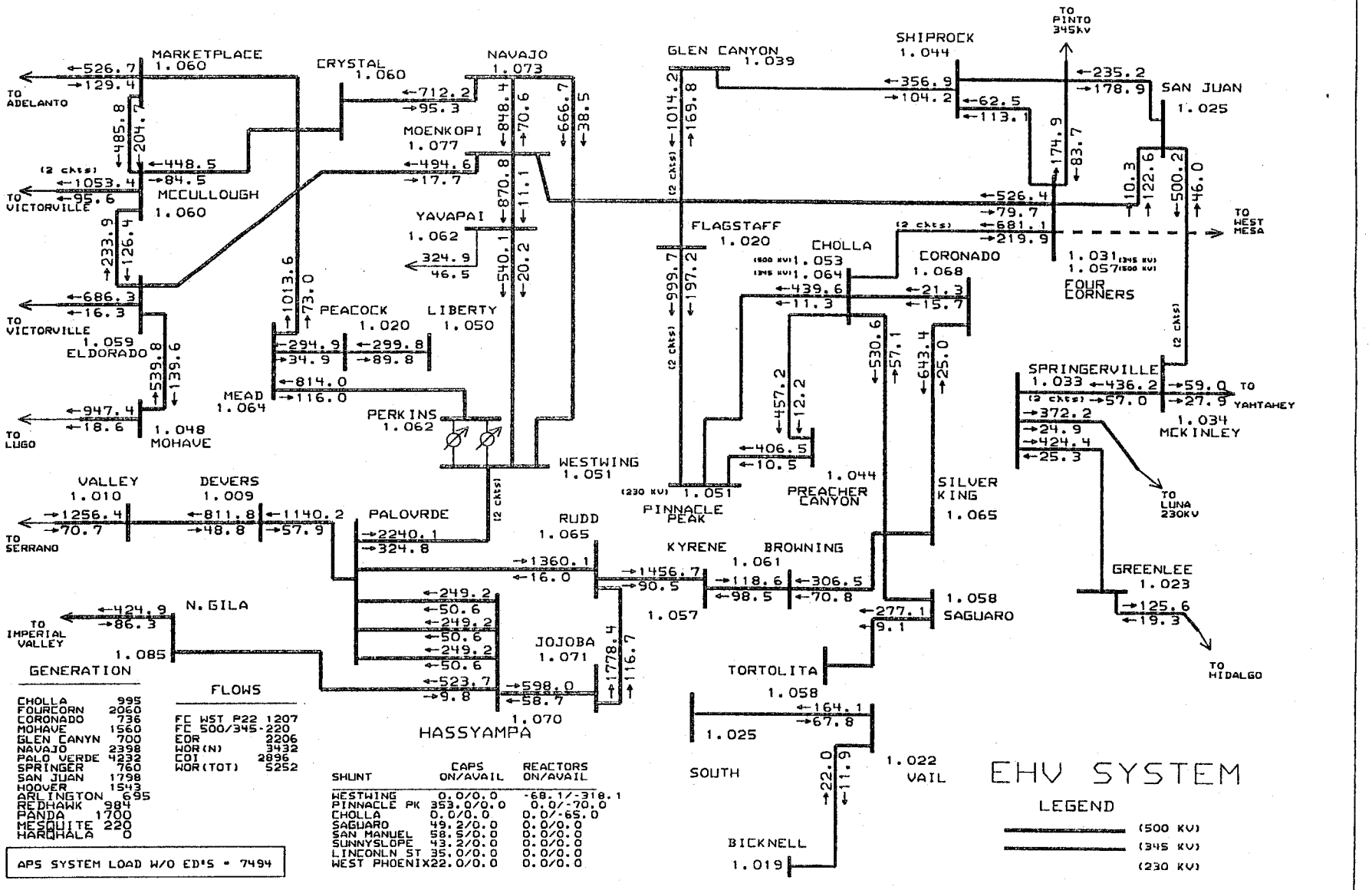
no230_05.drw
sm05s24a.wrk
Rating = 2

SOUTHERN ARIZONA SYSTEM



General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:30:51 2003

GE Transmission Planning	APS 2004 PLANNING CASE WECC 2003 H53-SA APPROVED BASE CASE 2005	BASECASE N-0	so230_05.drw sm05s24a.wrk Rating = 2



GENERATION

CHOLLA	995
FOURCORN	2060
CORONADO	736
MOHAVE	1560
GLEN CANYN	700
NAVAJO	2398
PALO VERDE	4232
SPRINGER	760
SAN JUAN	1798
HOOVER	1543
ARLINGTON	695
REDHAWK	984
PANDA	1700
MESQUITE	220
HARQHALA	0

FLOWS

FC WST P22	1207
FC 500/345	220
EOR	2206
WOR(N)	3432
COI	2896
WOR(TOT)	5252

APS SYSTEM LOAD W/O ED'S = 7494

SHUNT	CAPS ON/AVAIL	REACTORS ON/AVAIL
WESTWING	0.0/0.0	-68.1/-318.1
PINNACLE PK	353.0/0.0	0.0/-70.0
CHOLLA	0.0/0.0	0.0/-65.0
SAGUARO	49.2/0.0	0.0/0.0
SAN MANUEL	58.5/0.0	0.0/0.0
SUNNYSLOPE	43.2/0.0	0.0/0.0
LINCONLN ST	35.0/0.0	0.0/0.0
WEST PHOENIX	22.0/0.0	0.0/0.0

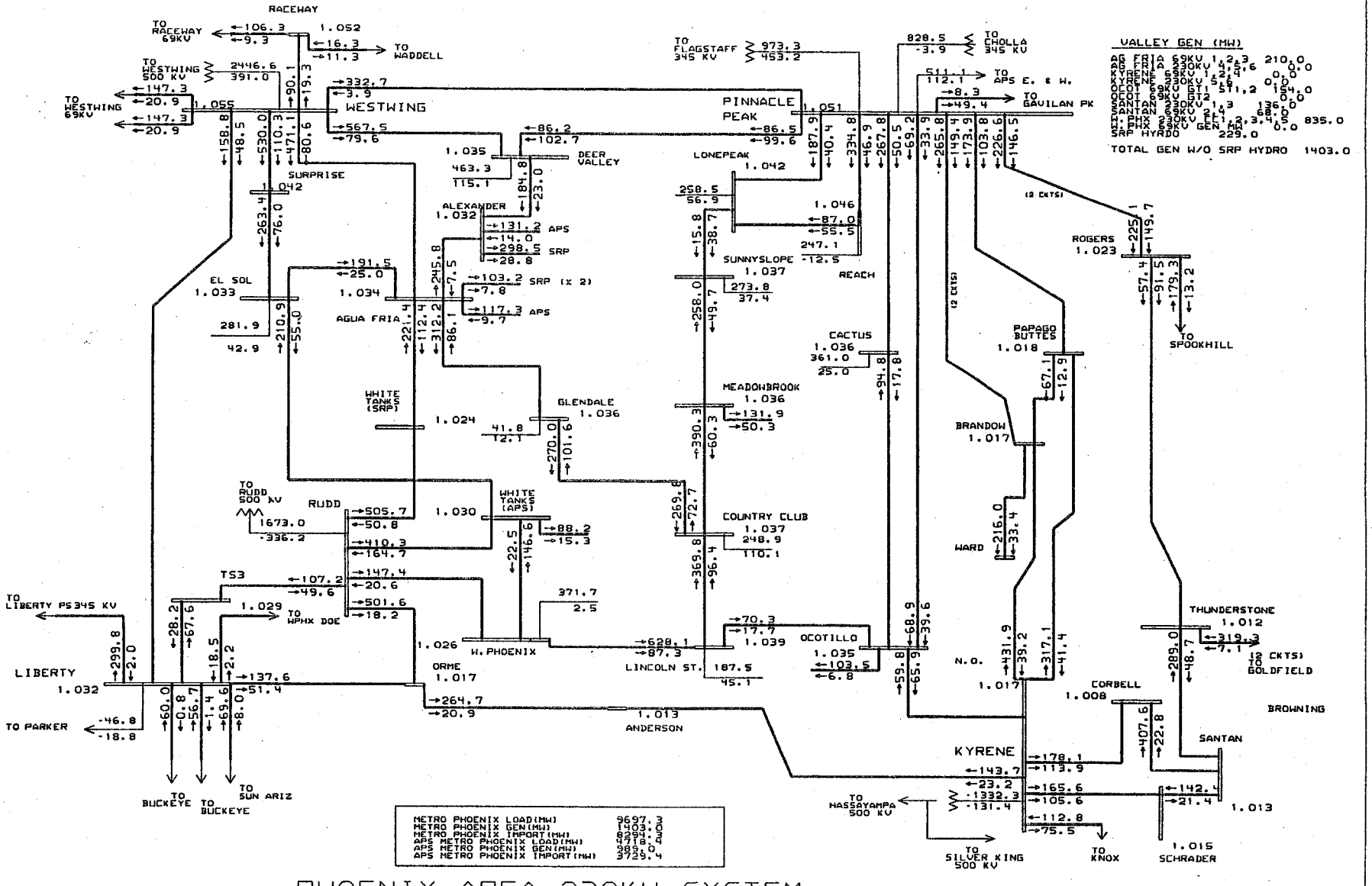
General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:31:11 2003

APS Transmission Planning

sev_hv_rev4.sav from sev_hv_rev3.sav modified 08/26/02
originally 06hs2sa.sav from WECC BB used for CATS EHV SUBCOM
2006

BASECASE N-0

ehv_06.drw
sm06s24a.wrk
Rating = 2



PHOENIX AREA 230KV SYSTEM

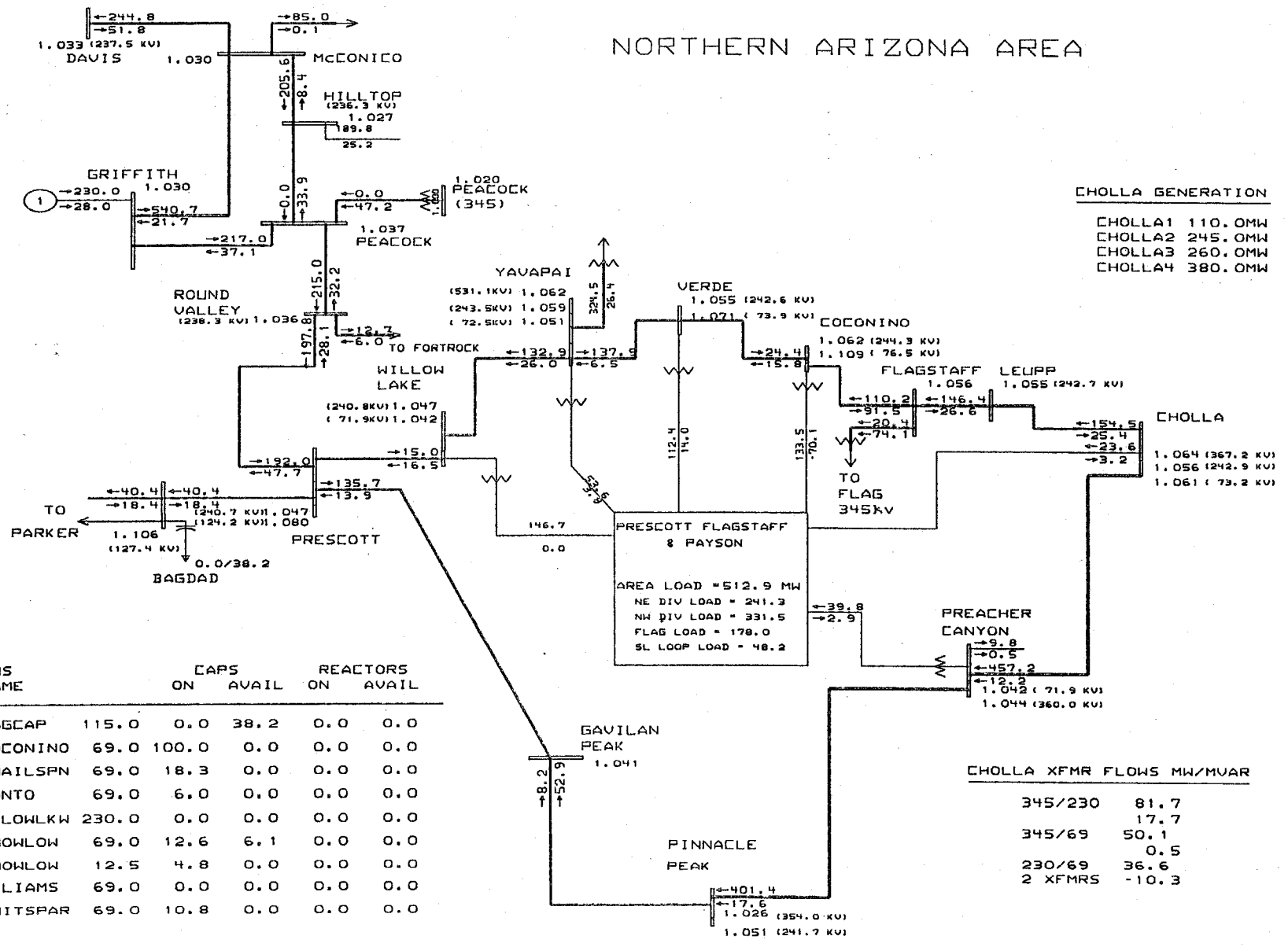
General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:31:13 2003

sev_hv_rev4.sav from sev_hv_rev3.sav modified 08/26/02
originally 06hs2sa.sav from WECC BB used for CATS EHV SUBCOM
2006

BASECASE N-0

met230_06.drw
sm06s24a.wrk
Rating = 2

NORTHERN ARIZONA AREA



CHOLLA GENERATION

CHOLLA1	110.0MW
CHOLLA2	245.0MW
CHOLLA3	260.0MW
CHOLLA4	380.0MW

CHOLLA XFMR FLOWS MW/MVAR

345/230	81.7
	17.7
345/69	50.1
	0.5
230/69	36.6
2 XFMRS	-10.3

BUS NAME		CAPS ON	CAPS AVAIL	REACTORS ON	REACTORS AVAIL
BAGCAP	115.0	0.0	38.2	0.0	0.0
COCONINO	69.0	100.0	0.0	0.0	0.0
QUAILSPN	69.0	18.3	0.0	0.0	0.0
TONTO	69.0	6.0	0.0	0.0	0.0
WILOWLKW	230.0	0.0	0.0	0.0	0.0
SHOWLOW	69.0	12.6	6.1	0.0	0.0
SHOWLOW	12.5	4.8	0.0	0.0	0.0
WILIAMS	69.0	0.0	0.0	0.0	0.0
WHITSPAR	69.0	10.8	0.0	0.0	0.0

General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:31:19 2003

APS Transmission Planning

sev_hv_rev4.sav from sev_hv_rev3.sav modified 08/26/02
originally 06hs2sa.sav from WECC BB used for CATS EHV SUBCOM
2006

BASECASE N-0

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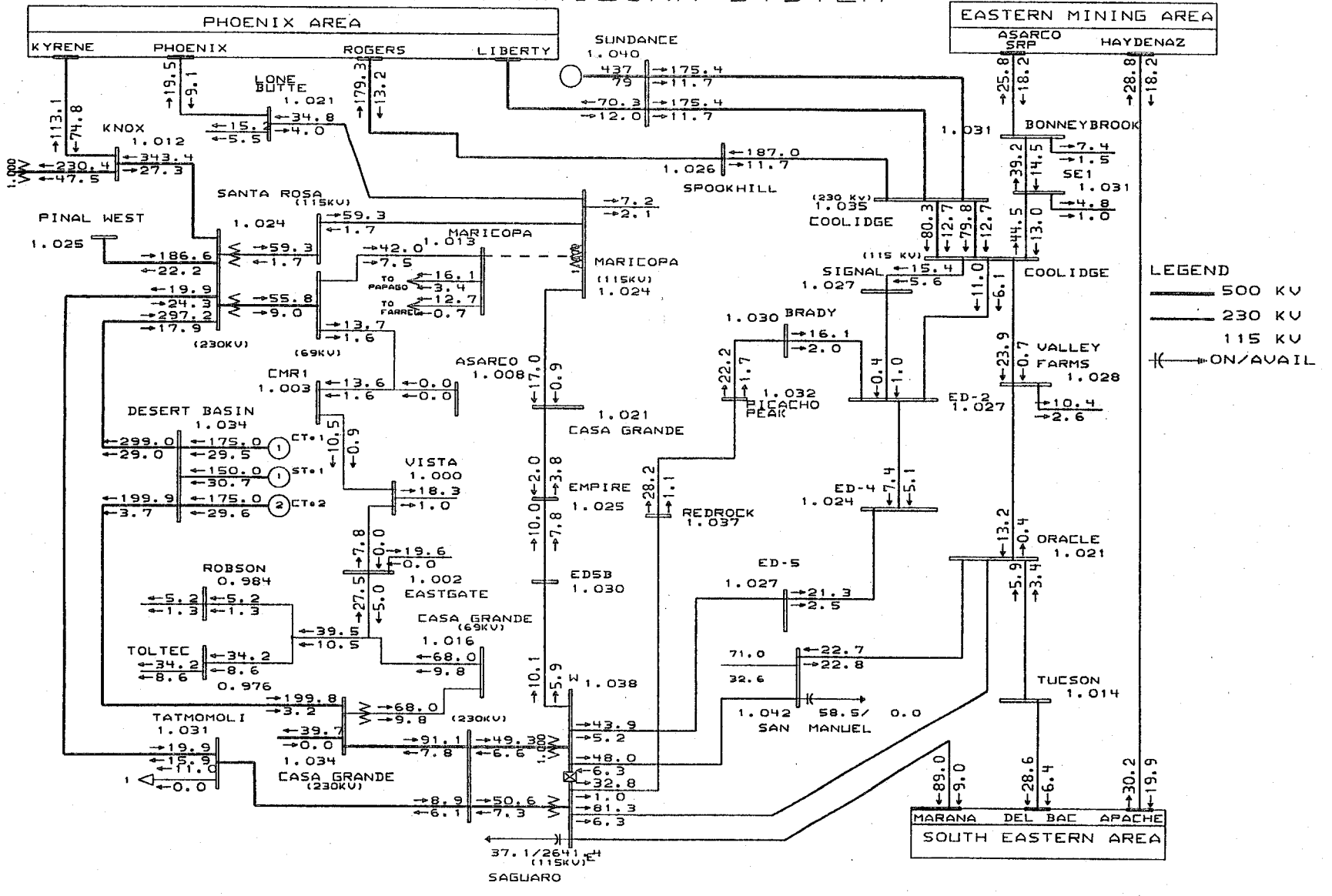
sm06:24a.wrk
Rating = 2

415



General Electric International, Inc. PSLF Program

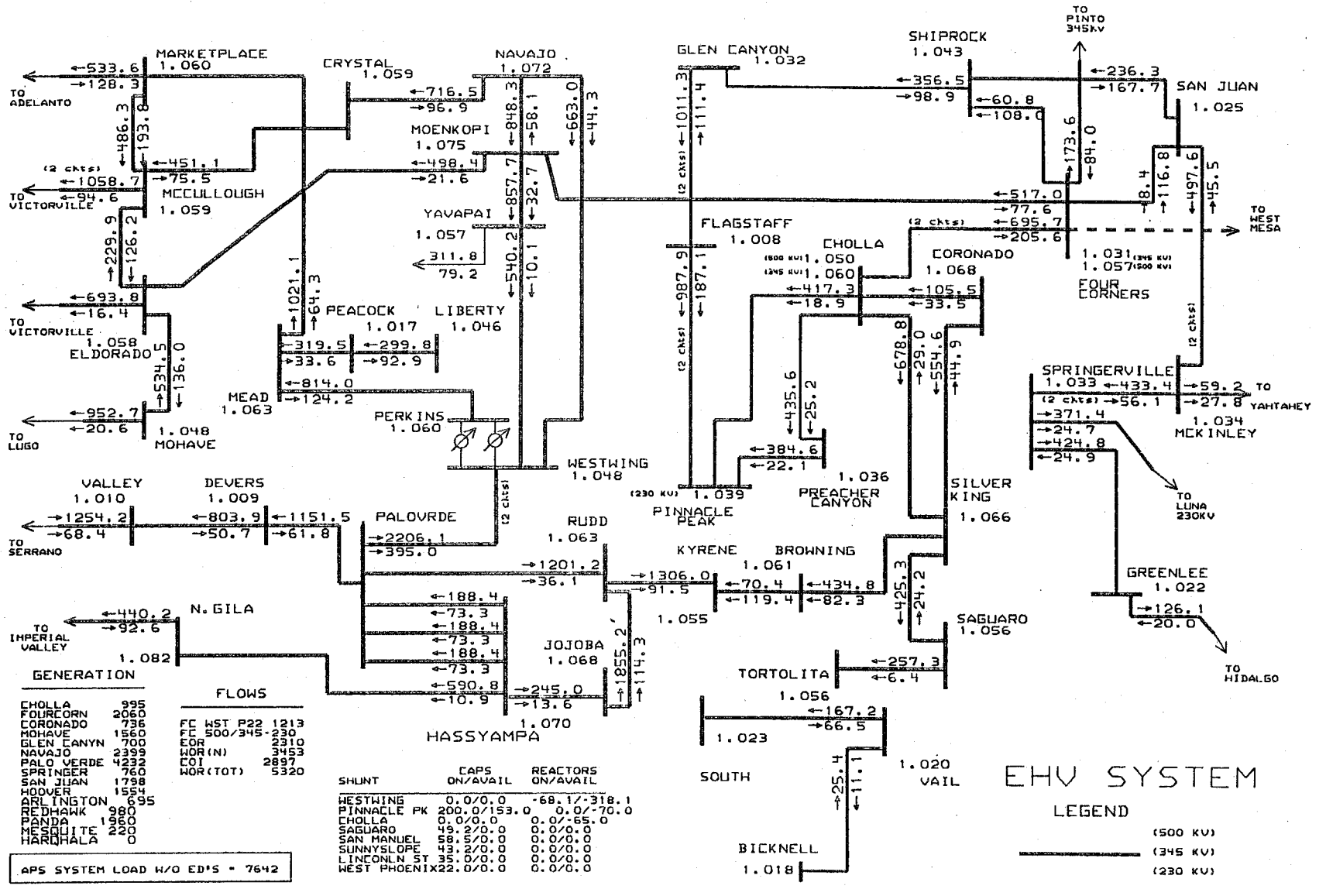
MW/MVAR Tue Jan 21 07:31:24 2003

[redacted]smission [redacted]ning

sev_hv_rev4.sav from sev_hv_rev3.sav modified 08/26/02
originally 06hs2sa.sav from WECC BB used for CATS EHV SUBCOM
2006

BASECASE N-0

so230_06.drw
sm06:24a.wrk
Rating = 2



GENERATION

CHOLLA	995
FOURCORN	2060
CORONADO	736
MOHAVE	1560
GLEN CANYN	700
NAVAJO	2399
PALO VERDE	4232
SPRINGER	760
SAN JUAN	1798
HOOVER	1554
ARLINGTON	695
REDHAWK	980
PANDA	1960
MESQUITE	220
HARQHALA	0

APS SYSTEM LOAD W/O ED'S = 7642

FLOWS

FC WST P22	1213
FC 500/345-230	
EOR	2310
WOR(N)	3453
COI	2897
WOR(TOT)	5320

SHUNT	CAPS ON/AVAIL	REACTORS ON/AVAIL
WESTWING	0.0/0.0	-68.1/-318.1
PINNACLE PK	200.0/153.0	0.0/-70.0
CHOLLA	0.0/0.0	0.0/-65.0
SAGUARO	49.2/0.0	0.0/0.0
SAN MANUEL	58.5/0.0	0.0/0.0
SUNNYSLOPE	43.2/0.0	0.0/0.0
LINCONLN ST	35.0/0.0	0.0/0.0
WEST PHOENIX	22.0/0.0	0.0/0.0

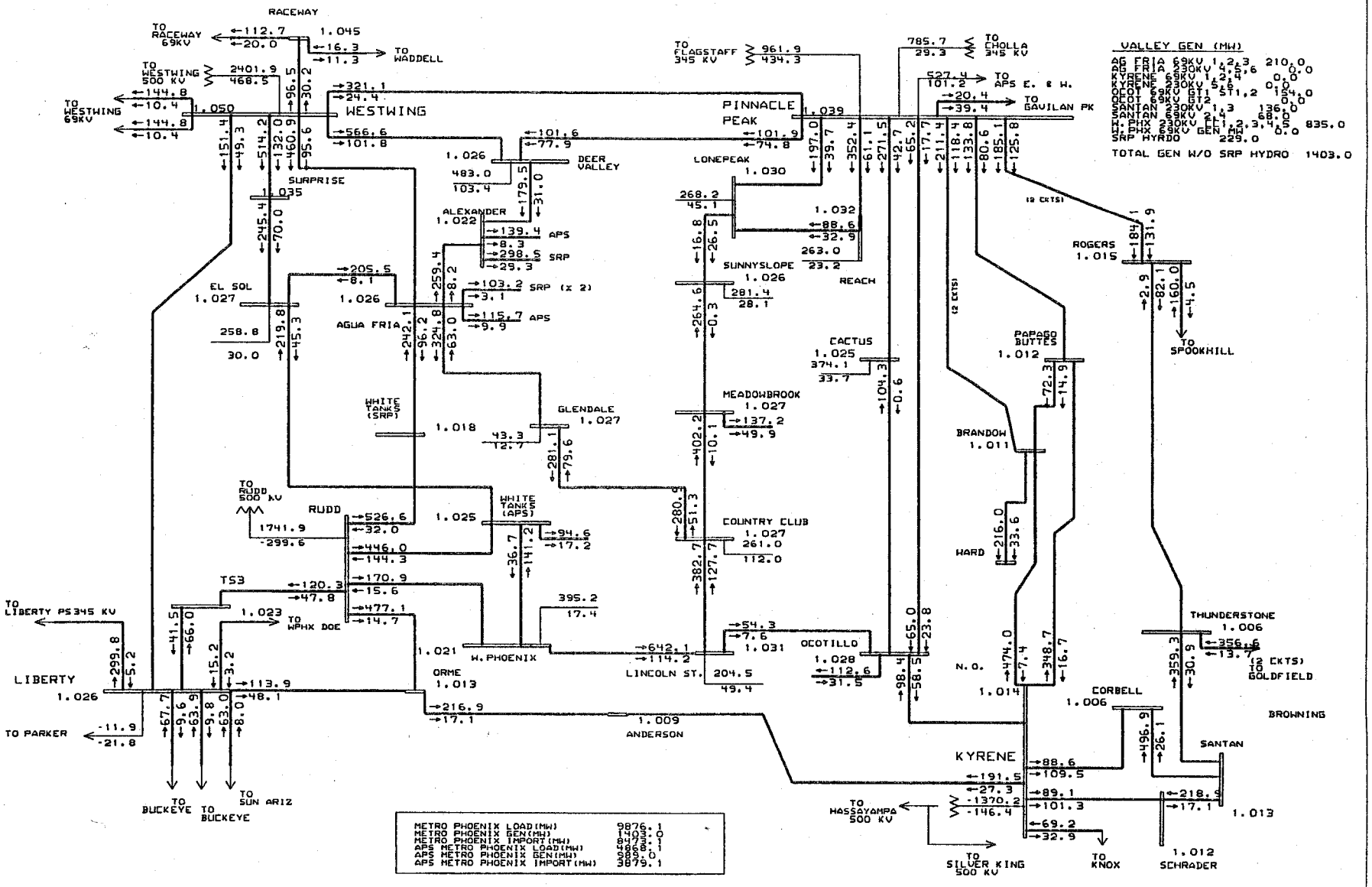
General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:31:44 2003

APS Transmission Planning

sev_hv_rev4.sav from sev_hv_rev3.sav modified 08/26/02
originally 06hs2sa.sav from WECC BB used for CATS EHV SUBCOM
2007

BASECASE N-0

ehv_07.drw
sm07s24a.wrk
Rating = 2



PHOENIX AREA 230KV SYSTEM

A19

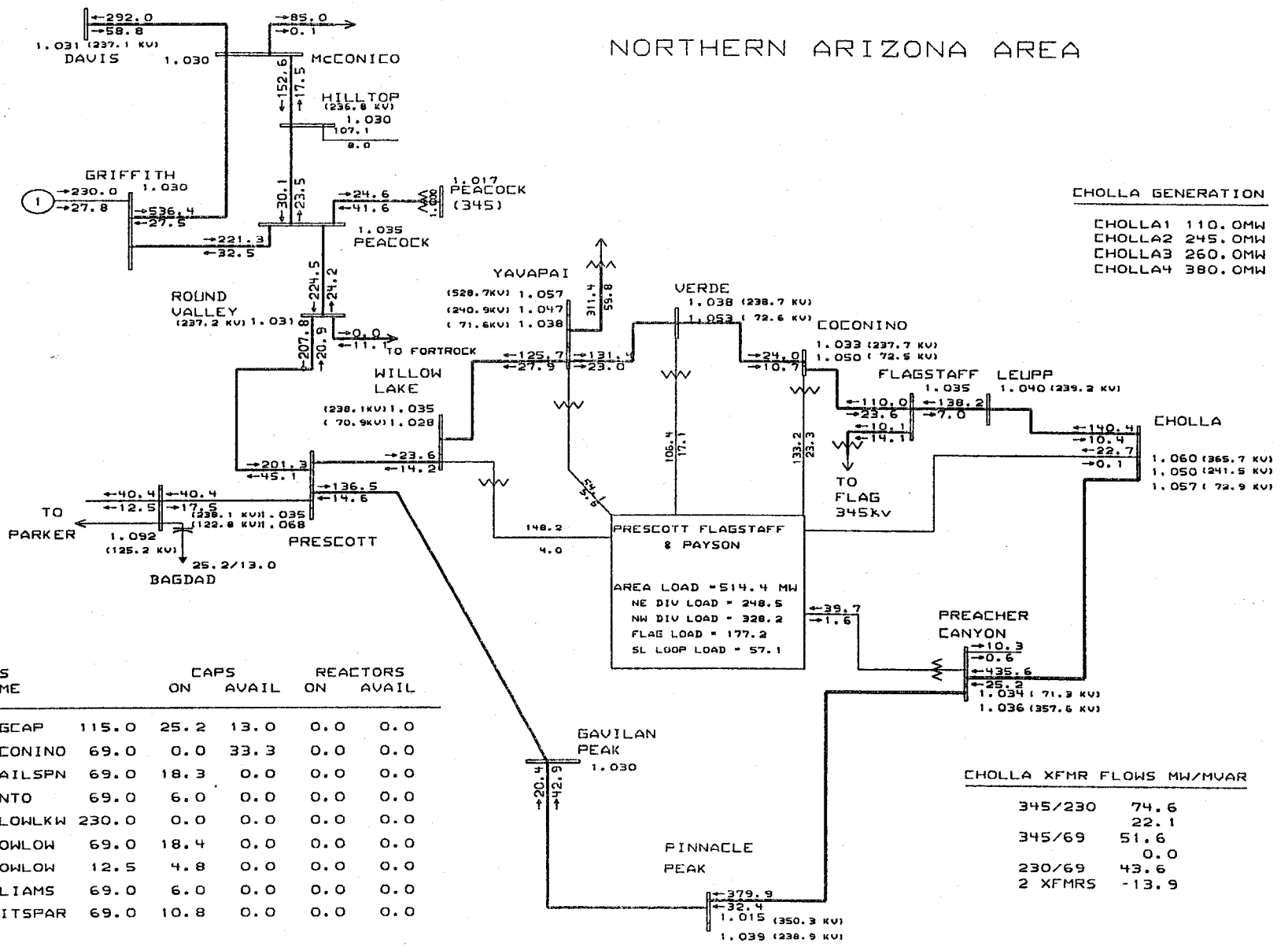
General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:31:46 2003

sev_hv_rev4.sav from sev_hv_rev3.sav modified 08/26/02
originally 06hs2sa.sav from WECC BB used for CATS EHV SUBCOM
2007

BASECASE N-0

met230_07.drw
sm07s24a.wrk
Rating = 2

NORTHERN ARIZONA AREA



CHOLLA GENERATION

CHOLLA1	110.0MW
CHOLLA2	245.0MW
CHOLLA3	260.0MW
CHOLLA4	380.0MW

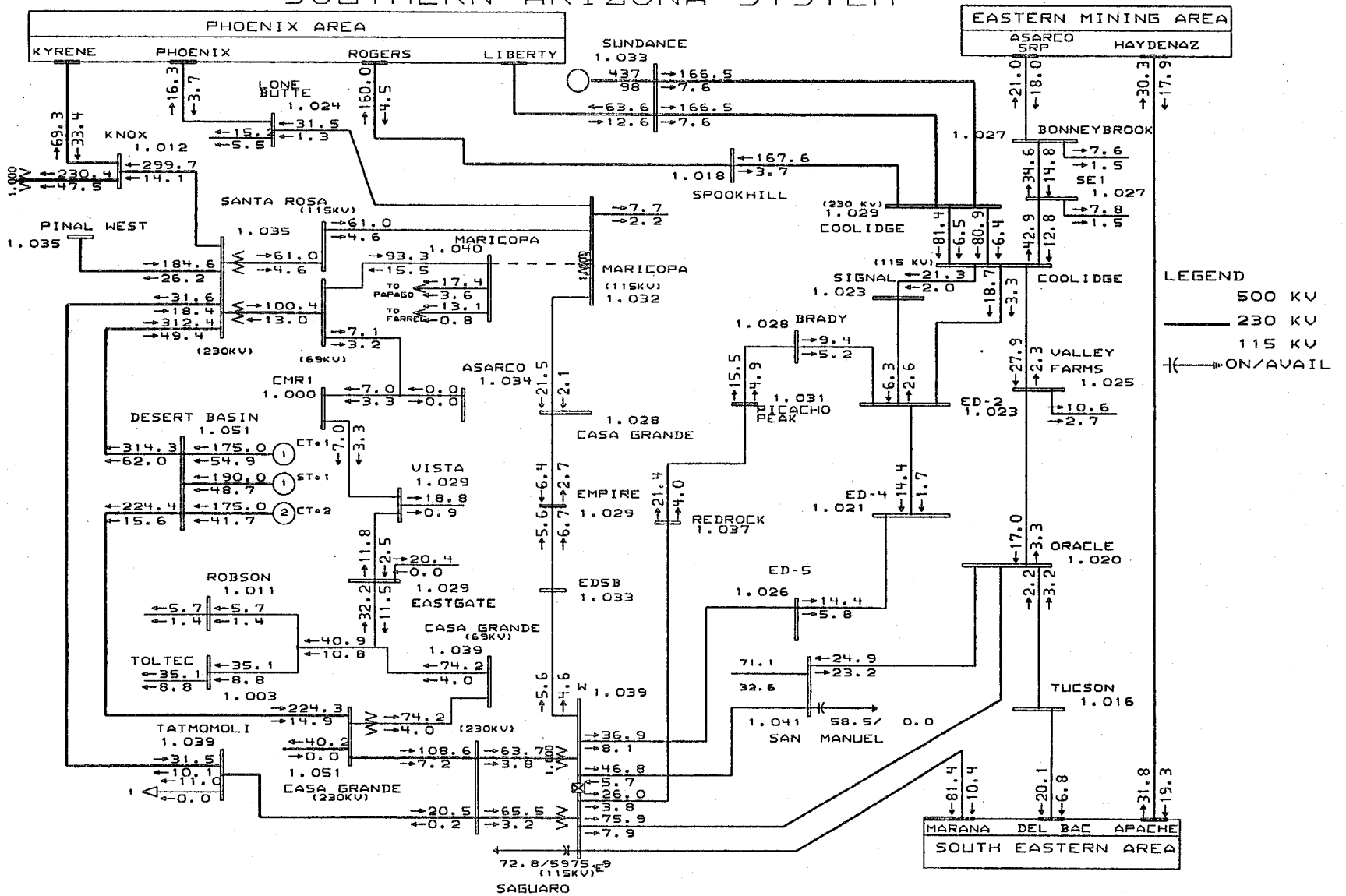
CHOLLA XFMR FLOWS MW/MVAR

345/230	74.6
	22.1
345/69	51.6
	0.0
230/69	43.6
2 XFMRS	-13.9

BUS NAME		CAPS ON	CAPS AVAIL	REACTORS ON	REACTORS AVAIL
BAGCAP	115.0	25.2	13.0	0.0	0.0
COCONINO	69.0	0.0	33.3	0.0	0.0
QUAILSPN	69.0	18.3	0.0	0.0	0.0
TONTO	69.0	6.0	0.0	0.0	0.0
WILOWLKW	230.0	0.0	0.0	0.0	0.0
SHOWLOW	69.0	18.4	0.0	0.0	0.0
SHOWLOW	12.5	4.8	0.0	0.0	0.0
WILIAMS	69.0	6.0	0.0	0.0	0.0
WHITSPAR	69.0	10.8	0.0	0.0	0.0

H 19

SOUTHERN ARIZONA SYSTEM



General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:31:57 2003

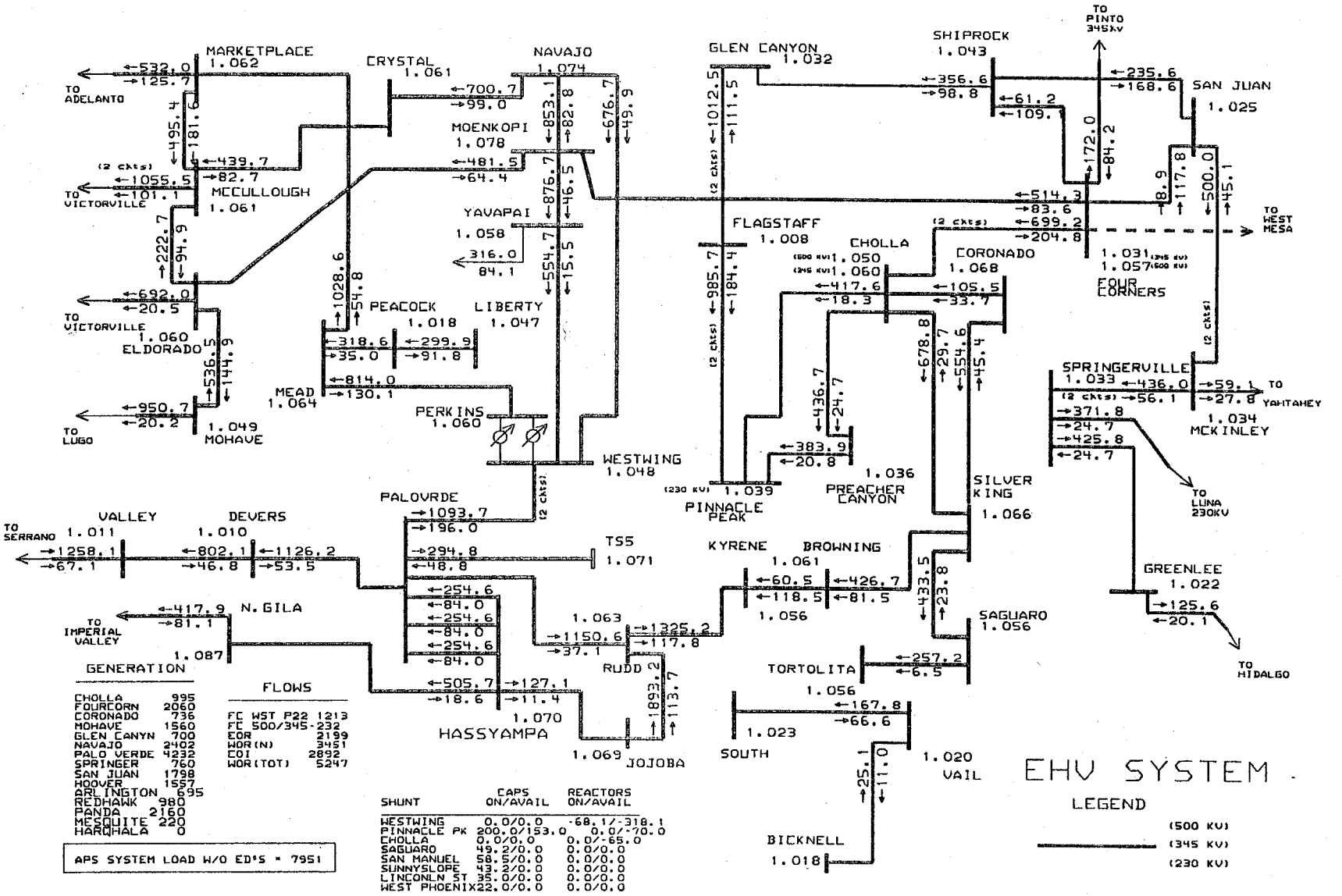
Transmission Planning

sev_hv_rev4.sav from sev_hv_rev3.sav modified 08/26/02
originally 06hs2sa.sav from WECC BB used for CATS EHV SUBCOM
2007

BASECASE N-0

so230_07.drw
sm07s24a.wrk
Rating = 2

A 96



GENERATION

CHOLLA	995
FOURCORN	2060
CORONADO	736
MOHAVE	1560
GLEN CANYN	700
NAVAJO	2402
PALO VERDE	4232
SPRINGER	760
SAN JUAN	1798
HOOVER	1557
ARLINGTON	695
REDHAWK	980
PANDA	2160
MESQUITE	220
HARQHALA	0

FLOWS

FC WST P22	1213
FC 500/345	-232
EOR	2199
WOR(N)	3451
COI	2892
WOR(TOT)	5247

APS SYSTEM LOAD W/O ED'S = 7951

SHUNT	CAPS ON/AVAIL	REACTORS ON/AVAIL
WESTWING	0.0/0.0	-68.1/-318.1
PINNACLE PK	200.0/153.0	0.0/-70.0
CHOLLA	0.0/0.0	0.0/-65.0
SAGUARO	49.2/0.0	0.0/0.0
SAN MANUEL	58.5/0.0	0.0/0.0
SUNNYSLOPE	43.2/0.0	0.0/0.0
LINCONLN ST	35.0/0.0	0.0/0.0
WEST PHOENIX	22.0/0.0	0.0/0.0

General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:32:17 2003

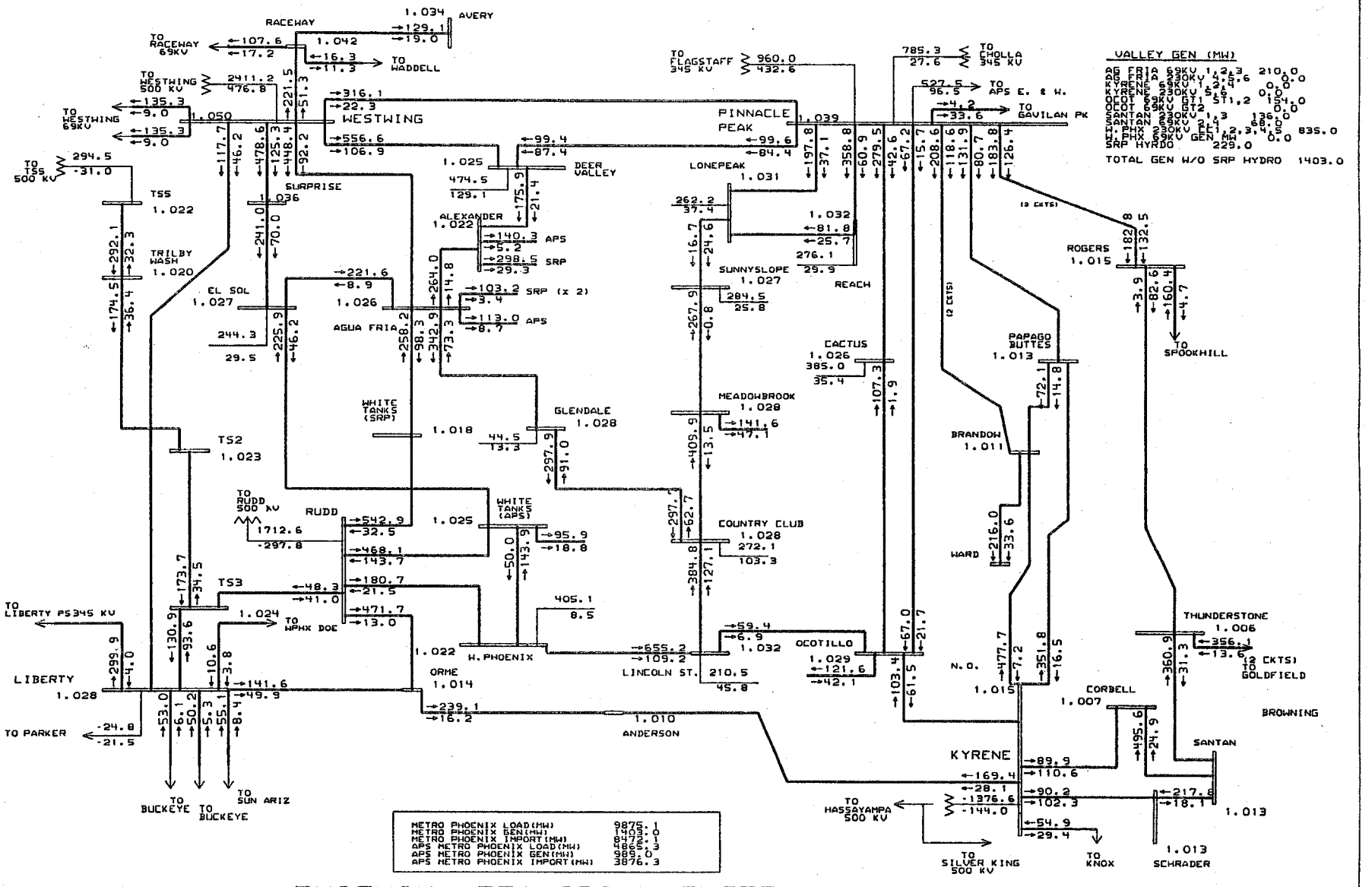
APS Transmission Planning

sev_hv_rev4.sav from sev_hv_rev3.sav modified 08/26/02
originally 06hs2sa.sav from WECC BB used for CATS EHV SUBCOM
2008

BASECASE N-0

ehv_08.drw
sm08s09a.wrk
Rating = 2

184



PHOENIX AREA 230KV SYSTEM

General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:32:[illegible] 2003

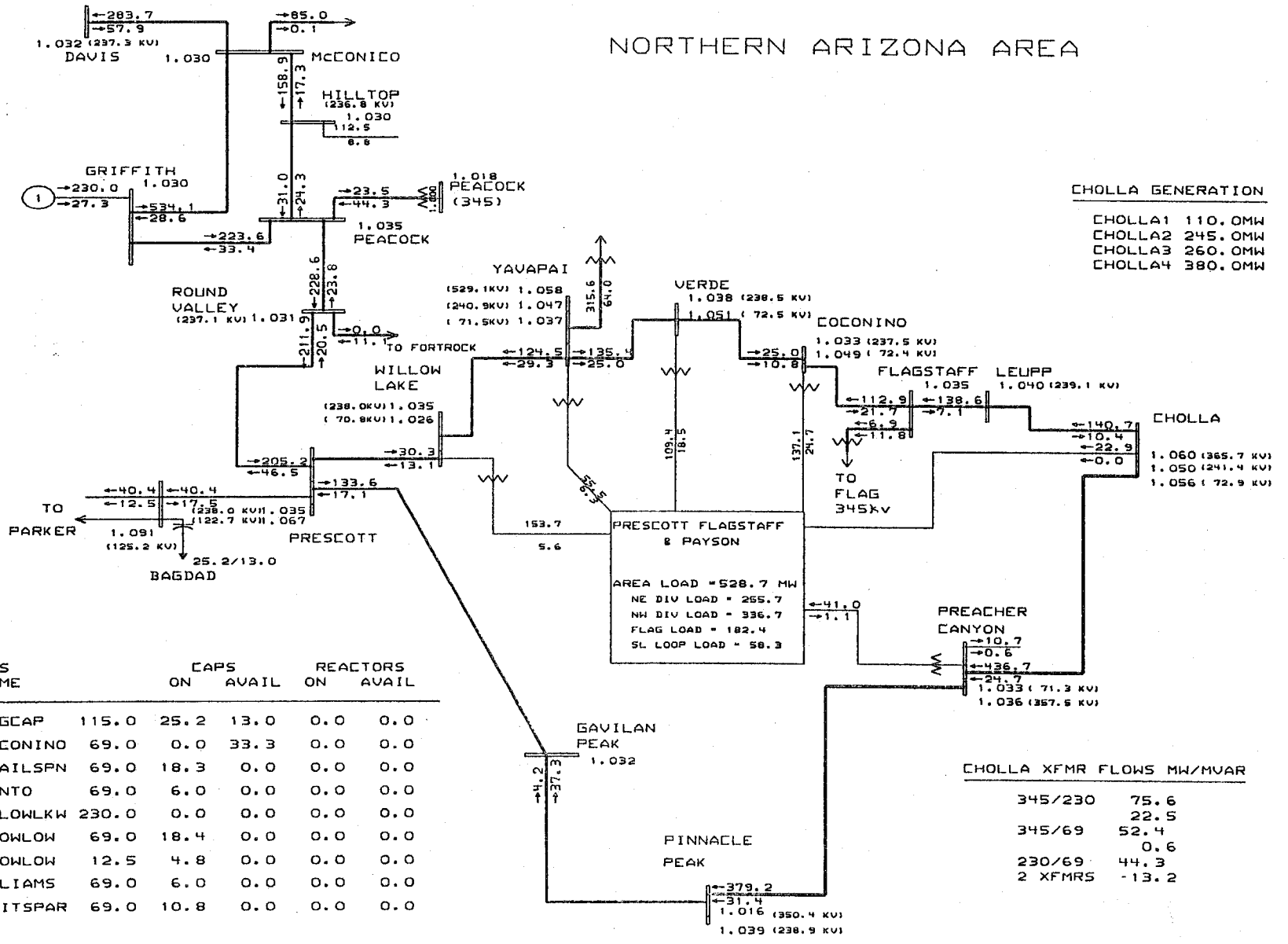
[illegible]smission P[illegible]nning

sev_hv_rev4.sav from sev_hv_rev3.sav modified 08/26/02
originally 06hs2sa.sav from WECC BB used for CATS EHV SUBCOM
2008

BASECASE N-0

met230_08.drw
sm08:09a.wrk
Rating = 2

NORTHERN ARIZONA AREA



CHOLLA GENERATION

CHOLLA1	110.0MW
CHOLLA2	245.0MW
CHOLLA3	260.0MW
CHOLLA4	380.0MW

CHOLLA XFMR FLOWS MW/MVAR

345/230	75.6
	22.5
345/69	52.4
	0.6
230/69	44.3
2 XFMRS	-13.2

BUS NAME		CAPS ON	CAPS AVAIL	REACTORS ON	REACTORS AVAIL
BAGCAP	115.0	25.2	13.0	0.0	0.0
COCONINO	69.0	0.0	33.3	0.0	0.0
QUAILSPN	69.0	18.3	0.0	0.0	0.0
TONTO	69.0	6.0	0.0	0.0	0.0
WILOWLKW	230.0	0.0	0.0	0.0	0.0
SHOWLOW	69.0	18.4	0.0	0.0	0.0
SHOWLOW	12.5	4.8	0.0	0.0	0.0
WILIAMS	69.0	6.0	0.0	0.0	0.0
WHITSPAR	69.0	10.8	0.0	0.0	0.0

A23

General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:32:25 2003

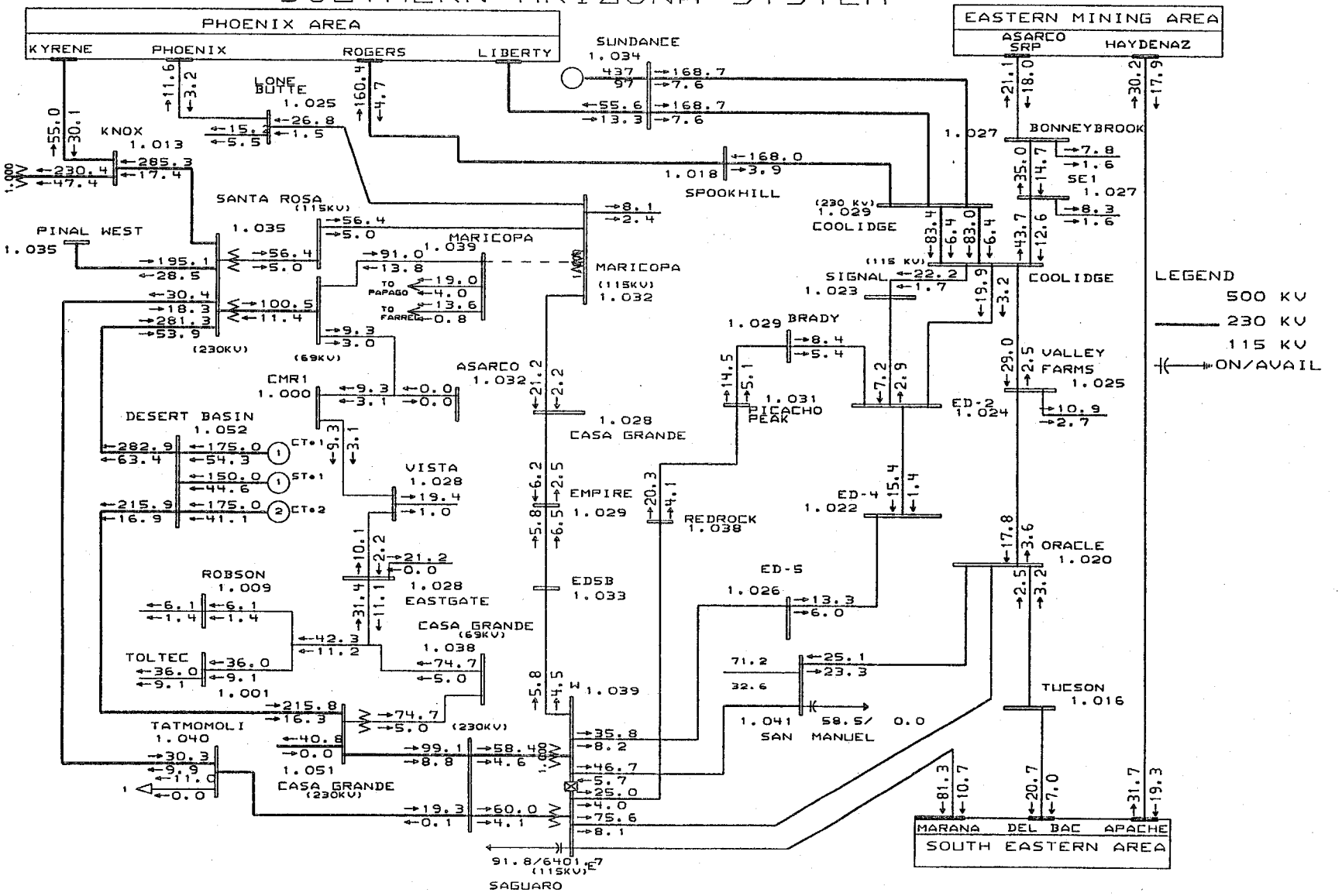
APS Transmission Planning

sev_hv_rev4.sav from sev_hv_rev3.sav modified 08/26/02
originally 06hs2sa.sav from WECC BB used for EATS EHV SUBCOM
2008

BASECASE N-0

no230_08.drw
sm08:09a.wrk
Rating = 2

SOUTHERN ARIZONA SYSTEM



General Electric International, Inc. PSLF Program

MW/MVAR

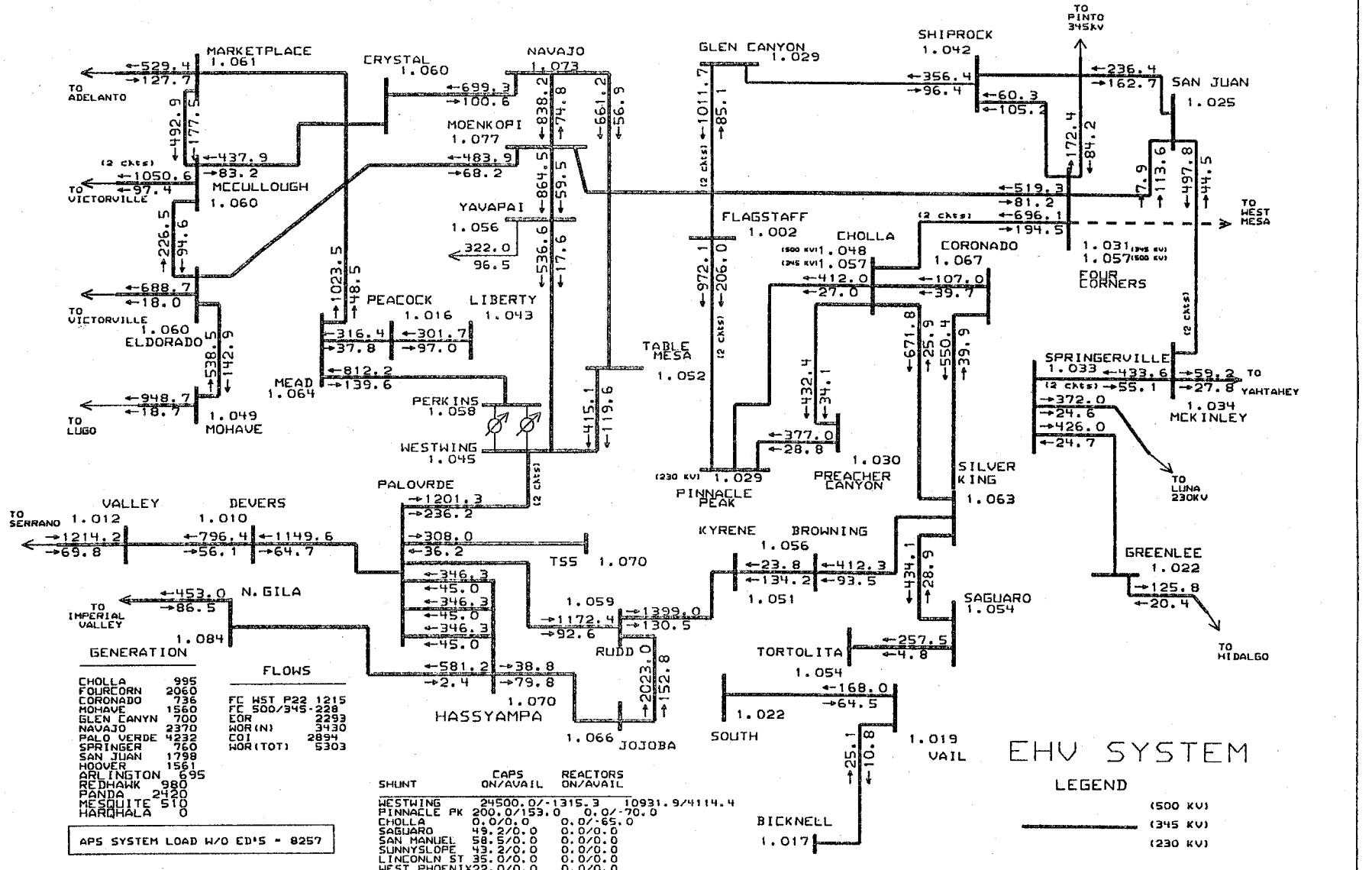
Tue Jan 21 07:32:31 2003

sev_hv_rev4.sav from sev_hv_rev3.sav modified 08/26/02
originally 06hs2sa.sav from WECC BB used for CATS EHV SUBCOM
2008

BASECASE N-0

so230_08.drw
sm08:09a.wrk
Rating = 2

A24



GENERATION

CHOLLA	995
FOURCORN	2060
CORONADO	736
MOHAVE	1560
GLEN CANYN	700
NAVAJO	2370
PALO VERDE	4232
SPRINGER	760
SAN JUAN	1798
HOOVER	1561
ARLINGTON	695
REDHAWK	980
PANDA	2420
MESQUITE	510
HARQHALA	0

FLOWS

FC WST P22	1215
FC 500/345-228	
EOR	2293
WOR(N)	3430
COI	2894
WOR(TOT)	5303

APS SYSTEM LOAD W/O ED'S = 8257

SHUNT	CAPS ON/AVAIL	REACTORS ON/AVAIL
WESTWING	24500.0/-1315.3	10931.9/4114.4
PINNACLE PK	200.0/153.0	0.0/-70.0
CHOLLA	0.0/0.0	0.0/-65.0
SAGUARO	49.2/0.0	0.0/0.0
SAN MANUEL	58.5/0.0	0.0/0.0
SUNNYSLOPE	43.2/0.0	0.0/0.0
LINCONLN ST	35.0/0.0	0.0/0.0
WEST PHOENIX	22.0/0.0	0.0/0.0

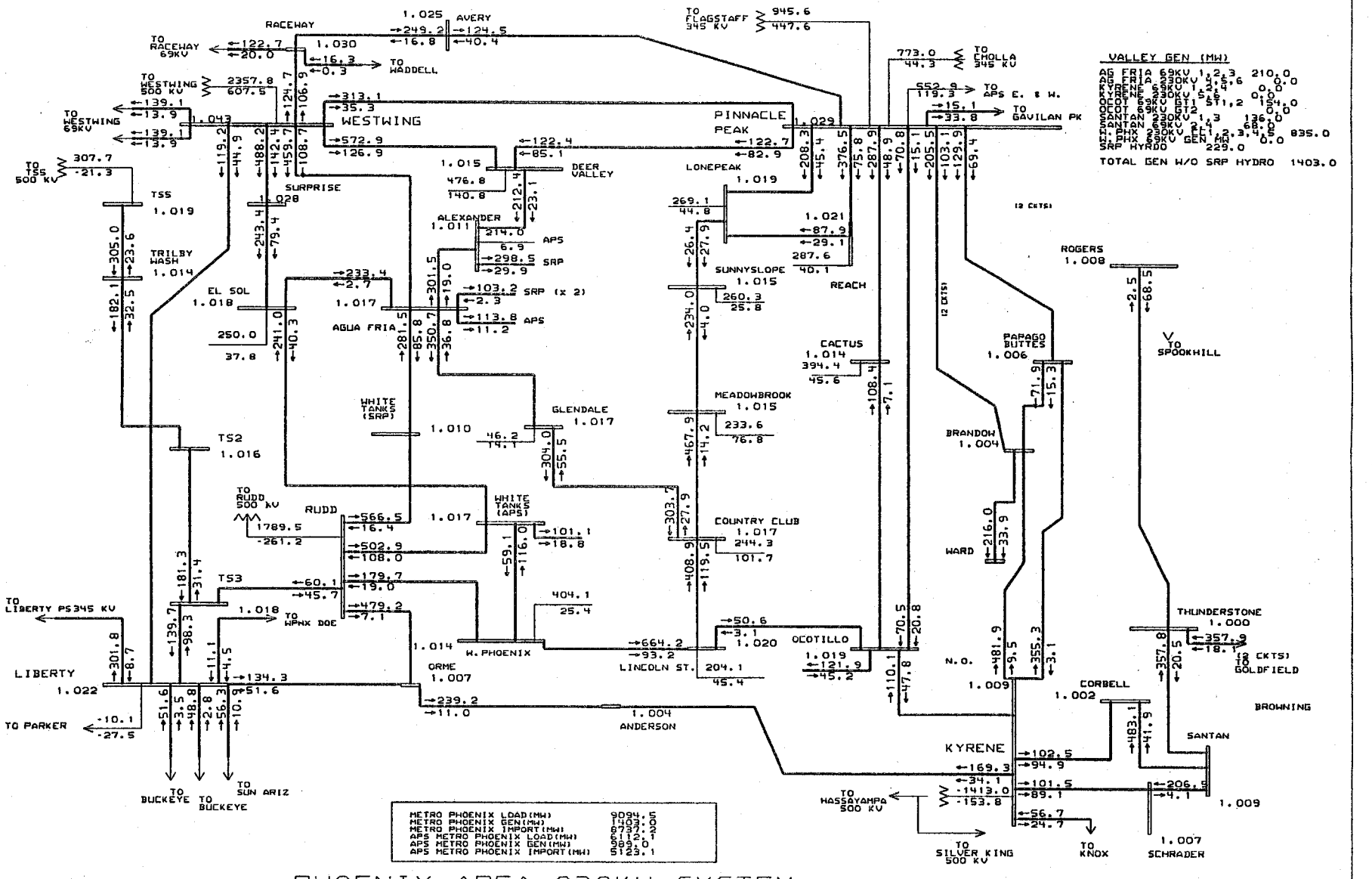
General Electric International, Inc. | PSLF Program | MW/MVAR | Tue Jan 21 07:32:52 2003

APS Transmission Planning

sev_hv_rev4.sav from sev_hv_rev3.sav modified 08/26/02
originally 06hs2sa.sav from WECC BB used for CATS EHV SUBCOM
2009

BASECASE N-0

ehv_09.drw
sm09s06a.wrk
Rating = 2



PHOENIX AREA 230KV SYSTEM

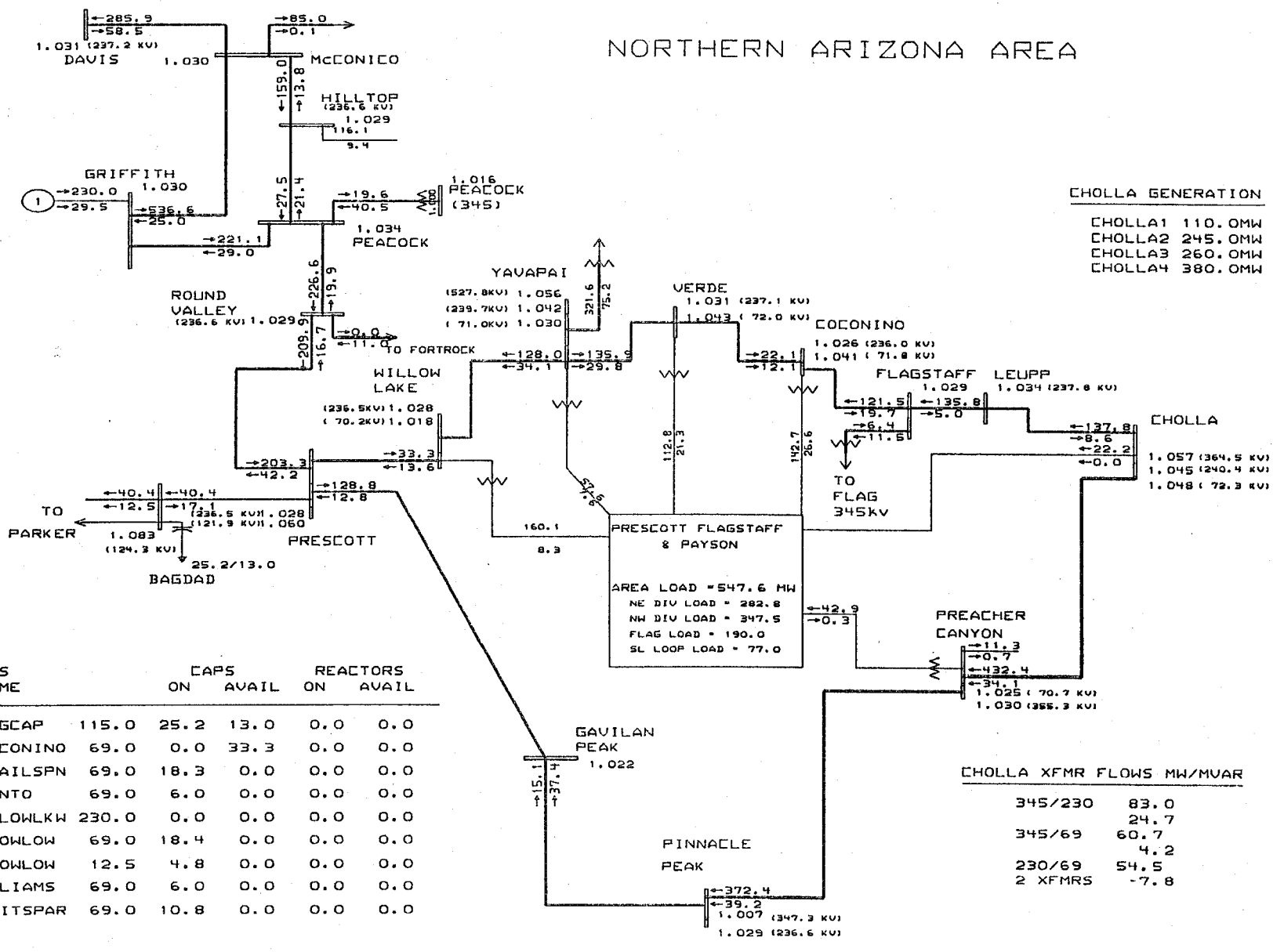
General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:32:54 2003

sev_hv_rev4.sav from sev_hv_rev3.sav modified 08/26/02
originally 06hs2sa.sav from WECC BB used for CATS EHV SUBCOM
2009

BASECASE N-0

met230_09.drw
sm09:06a.wrk
Rating = 2

NORTHERN ARIZONA AREA



CHOLLA GENERATION

CHOLLA1	110.0MW
CHOLLA2	245.0MW
CHOLLA3	260.0MW
CHOLLA4	380.0MW

CHOLLA XFMR FLOWS MW/MVAR

345/230	83.0
	24.7
345/69	60.7
	4.2
230/69	54.5
2 XFMRS	-7.8

BUS NAME		CAPS ON	CAPS AVAIL	REACTORS ON	REACTORS AVAIL
BAGCAP	115.0	25.2	13.0	0.0	0.0
COCONINO	69.0	0.0	33.3	0.0	0.0
QUAILSPN	69.0	18.3	0.0	0.0	0.0
TONTO	69.0	6.0	0.0	0.0	0.0
WILOWLKW	230.0	0.0	0.0	0.0	0.0
SHOWLOW	69.0	18.4	0.0	0.0	0.0
SHOWLOW	12.5	4.8	0.0	0.0	0.0
WILIAMS	69.0	6.0	0.0	0.0	0.0
WHITSPAR	69.0	10.8	0.0	0.0	0.0

General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:33:00 2003

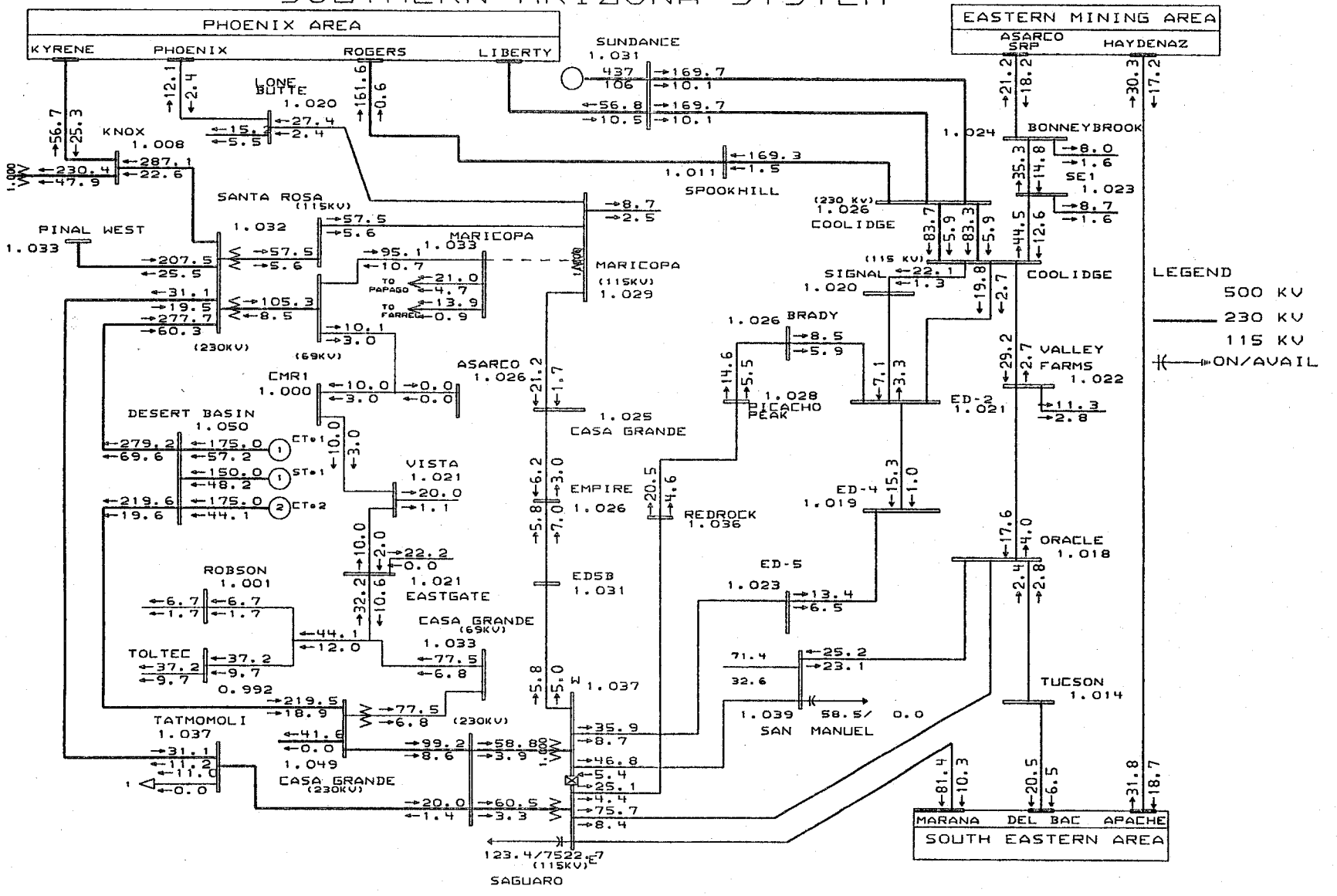
APS Transmission Planning

sev_hv_rev4.sav from sev_hv_rev3.sav modified 08/26/02
originally 06hs2sa.sav from WECC BB used for CATS EHV SUBCOM
2009

BASECASE N-0

no230_09.drw
sw09:06a.wrk
Rating = 2

SOUTHERN ARIZONA SYSTEM



General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:33:[illegible] 2003

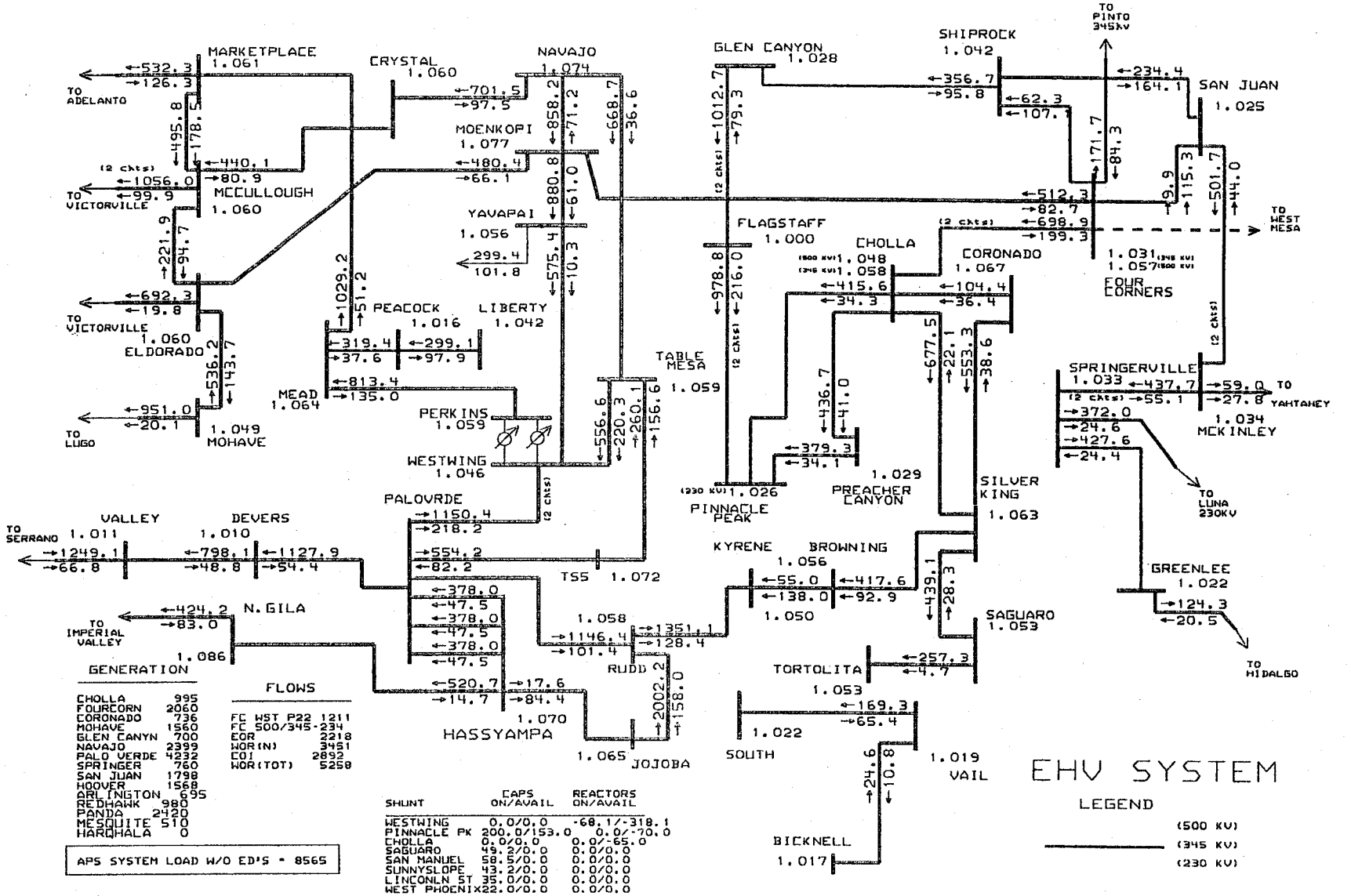
Transmission Planning

sev_hv_rev4.sav from sev_hv_rev3.sav modified 08/26/02
originally 06hs2sa.sav from WECC BB used for CATS EHV SUBCOM
2009

BASECASE N-0

so230_09.drw
sm09#06a.wrk
Rating = 2

D 08



General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:33:25 2003

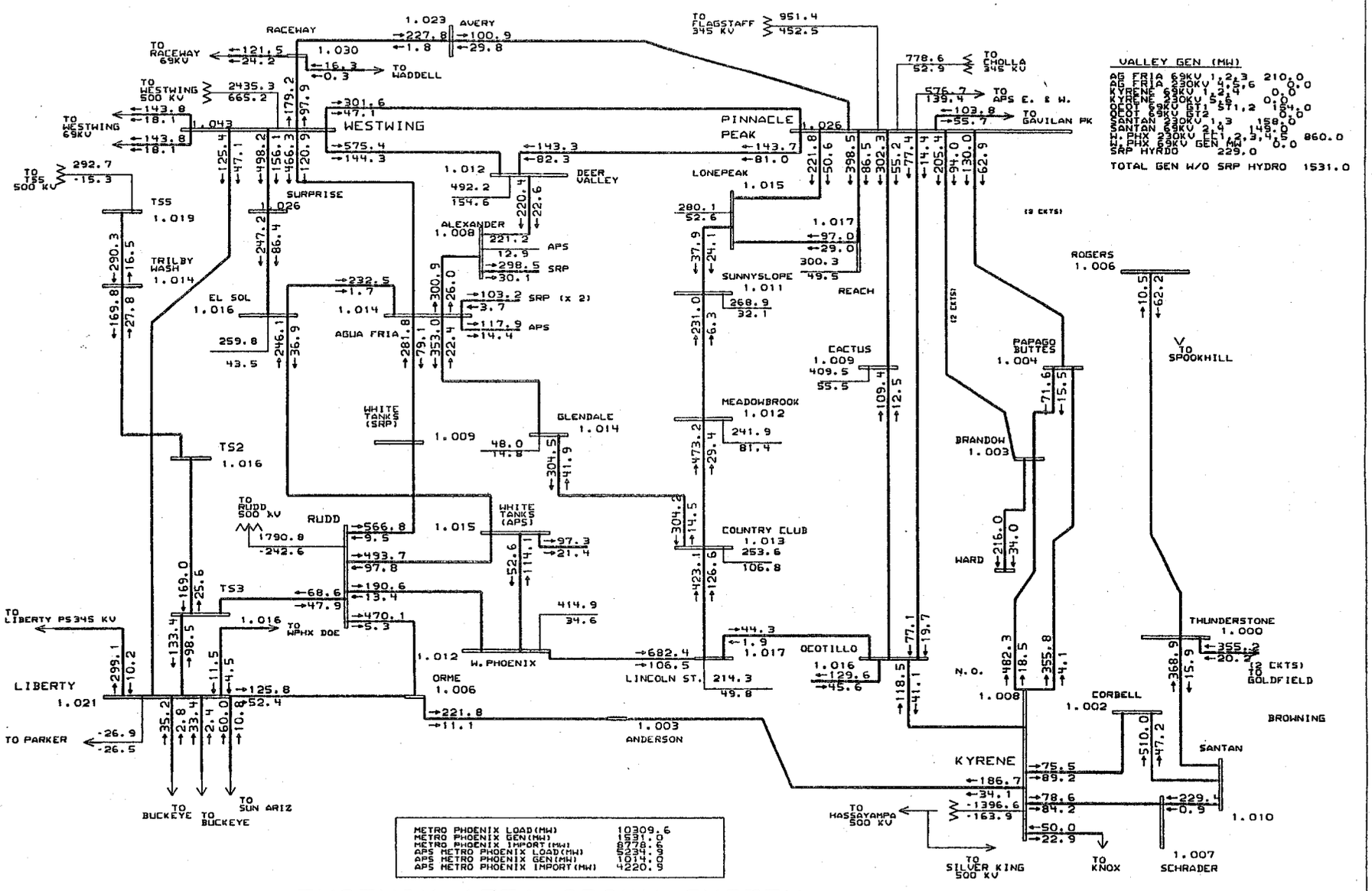
APS Transmission Planning

sev_hv_rev4.sav from sev_hv_rev3.sav modified 08/26/02
originally 06hs2sa.sav from WECC BB used for EATS EHV SUBCOM
2010

BASECASE N-0

ehv_2010.drw
sm10:06a.wrk
Rating = 2

D 19



PHOENIX AREA 230KV SYSTEM

A 30

General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:33:28 2003

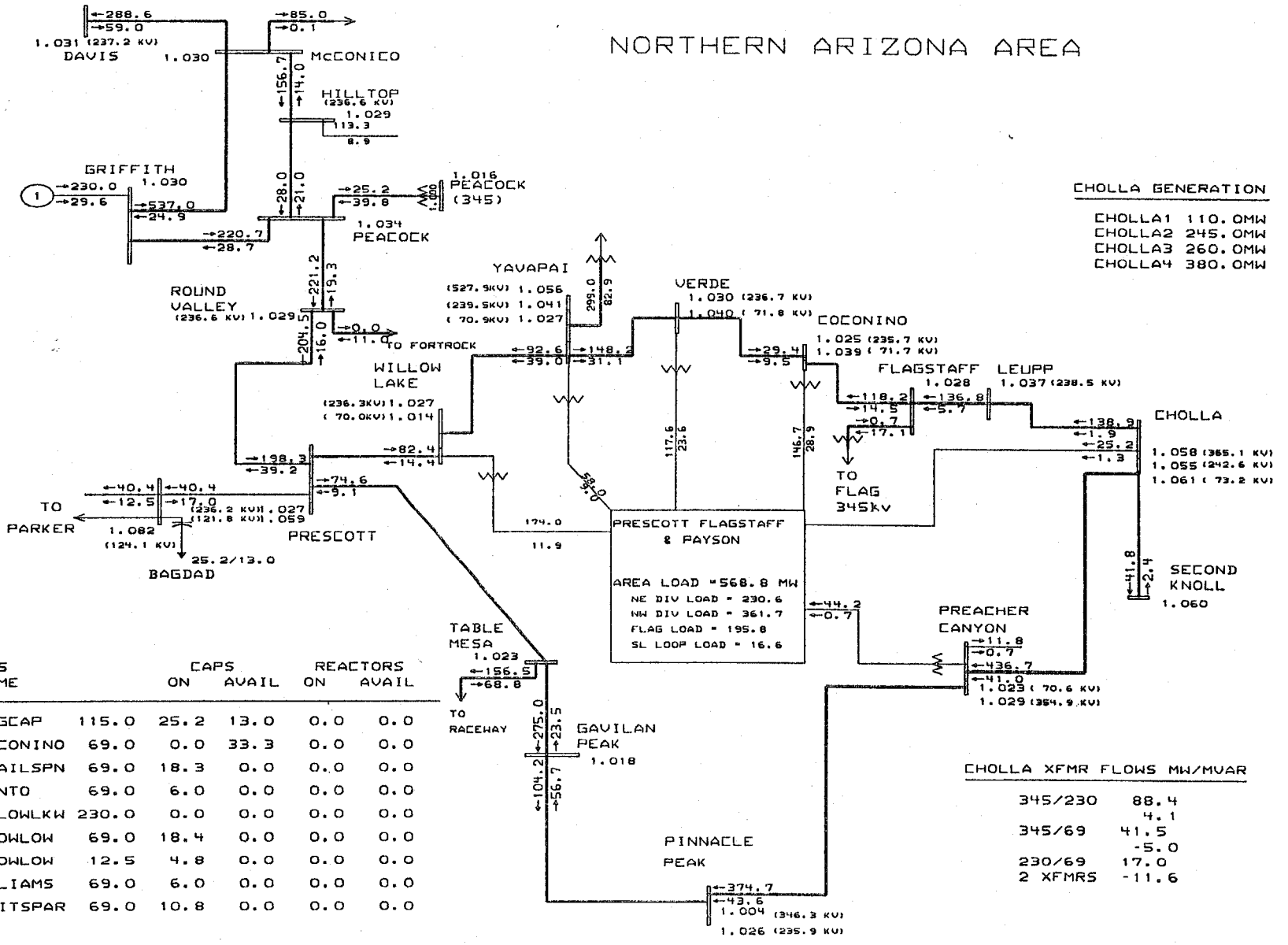
Transmission Planning

sev_hv_rev4.sav from sev_hv_rev3.sav modified 08/26/02
originally 06hs2sa.sav from WECC BB used for CATS EHV SUBCOM
2010

BASECASE N-0

met230_2010.drw
sm10:06a.wrk
Rating = 2

NORTHERN ARIZONA AREA



CHOLLA GENERATION

CHOLLA1	110.0MW
CHOLLA2	245.0MW
CHOLLA3	260.0MW
CHOLLA4	380.0MW

CHOLLA XFMR FLOWS MW/MVAR

345/230	88.4
	4.1
345/69	41.5
	-5.0
230/69	17.0
2 XFMRS	-11.6

BUS NAME		CAPS ON	CAPS AVAIL	REACTORS ON	REACTORS AVAIL
BAGCAP	115.0	25.2	13.0	0.0	0.0
COCONINO	69.0	0.0	33.3	0.0	0.0
QUAILSPN	69.0	18.3	0.0	0.0	0.0
TONTO	69.0	6.0	0.0	0.0	0.0
WILOWLKW	230.0	0.0	0.0	0.0	0.0
SHOWLOW	69.0	18.4	0.0	0.0	0.0
SHOWLOW	12.5	4.8	0.0	0.0	0.0
WILIAMS	69.0	6.0	0.0	0.0	0.0
WHITSPAR	69.0	10.8	0.0	0.0	0.0

General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:33:34 2003

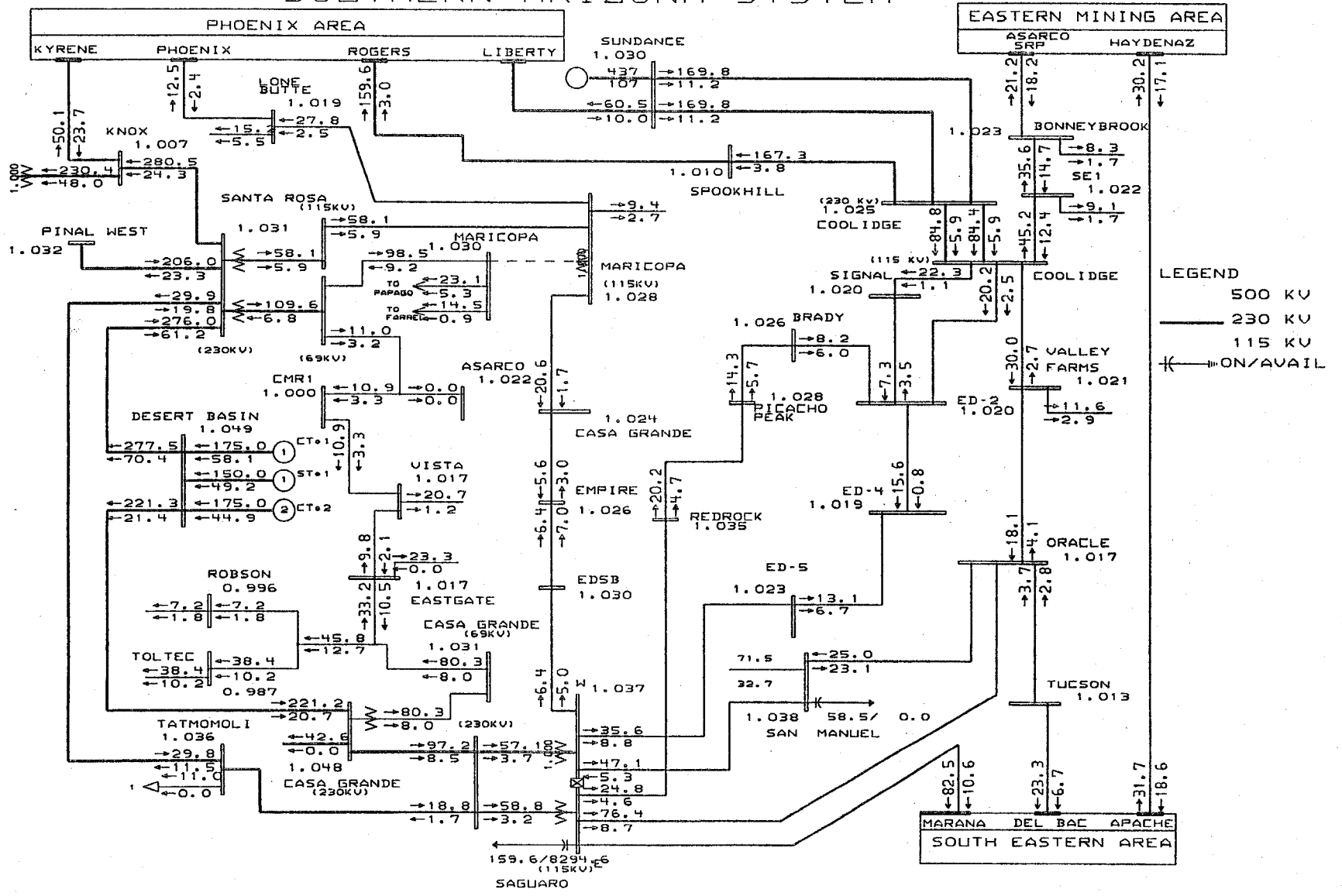
APS Transmission Planning

sev_hv_rev4.sav from sev_hv_rev3.sav modified 08/26/02
originally 06hs2sa.sav from WECC BB used for CAT5 EHV SUBCOM
2010

BASECASE N-0

no230_2010.drw
sm10#06a.wrk
Rating = 2

SOUTHERN ARIZONA SYSTEM



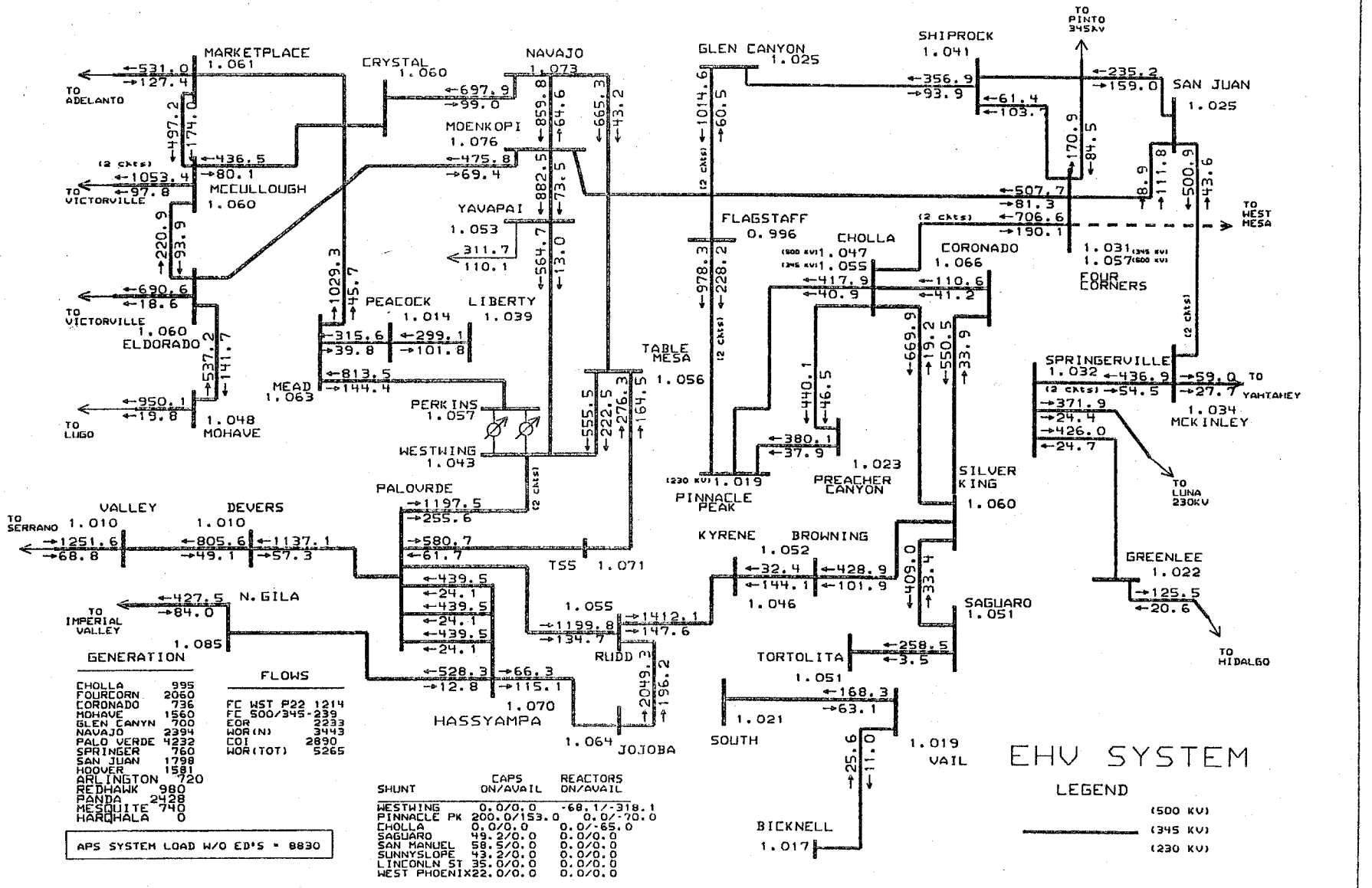
General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:33:38 2003

sev_hv_rev4.sav from sev_hv_rev3.sav modified 08/26/02
originally 06hs2sa.sav from WECC BB used for CATS EHV SUBCOM
2010

BASECASE N-0

so230_2010.drw
sm10s06a.wrk
Rating = 2

A20



GENERATION

CHOLLA	995
FOURCORN	2060
CORONADO	736
MOHAVE	1560
GLEN CANYN	700
NAVAJO	2394
PALO VERDE	4232
SPRINGER	760
SAN JUAN	1798
HOOVER	1581
ARLINGTON	720
REDHAWK	980
PANDA	2428
MESQUITE	740
HARQHALA	0

FLOWS

FC WST P22	1214
FC 500/345-239	
EOR	2233
WOR(N)	3443
COI	2890
WOR(TOT)	5265

APS SYSTEM LOAD W/O ED'S = 8830

SHUNT	CAPS ON/AVAIL	REACTORS ON/AVAIL
WESTWING	0.0/0.0	-68.1/-318.1
PINNACLE PK	200.0/153.0	0.0/-70.0
CHOLLA	0.0/0.0	0.0/-65.0
SAGUARO	49.2/0.0	0.0/0.0
SAN MANUEL	58.5/0.0	0.0/0.0
SUNNYSLOPE	43.2/0.0	0.0/0.0
LINCONLN ST	35.0/0.0	0.0/0.0
WEST PHOENIX	22.0/0.0	0.0/0.0

A 22

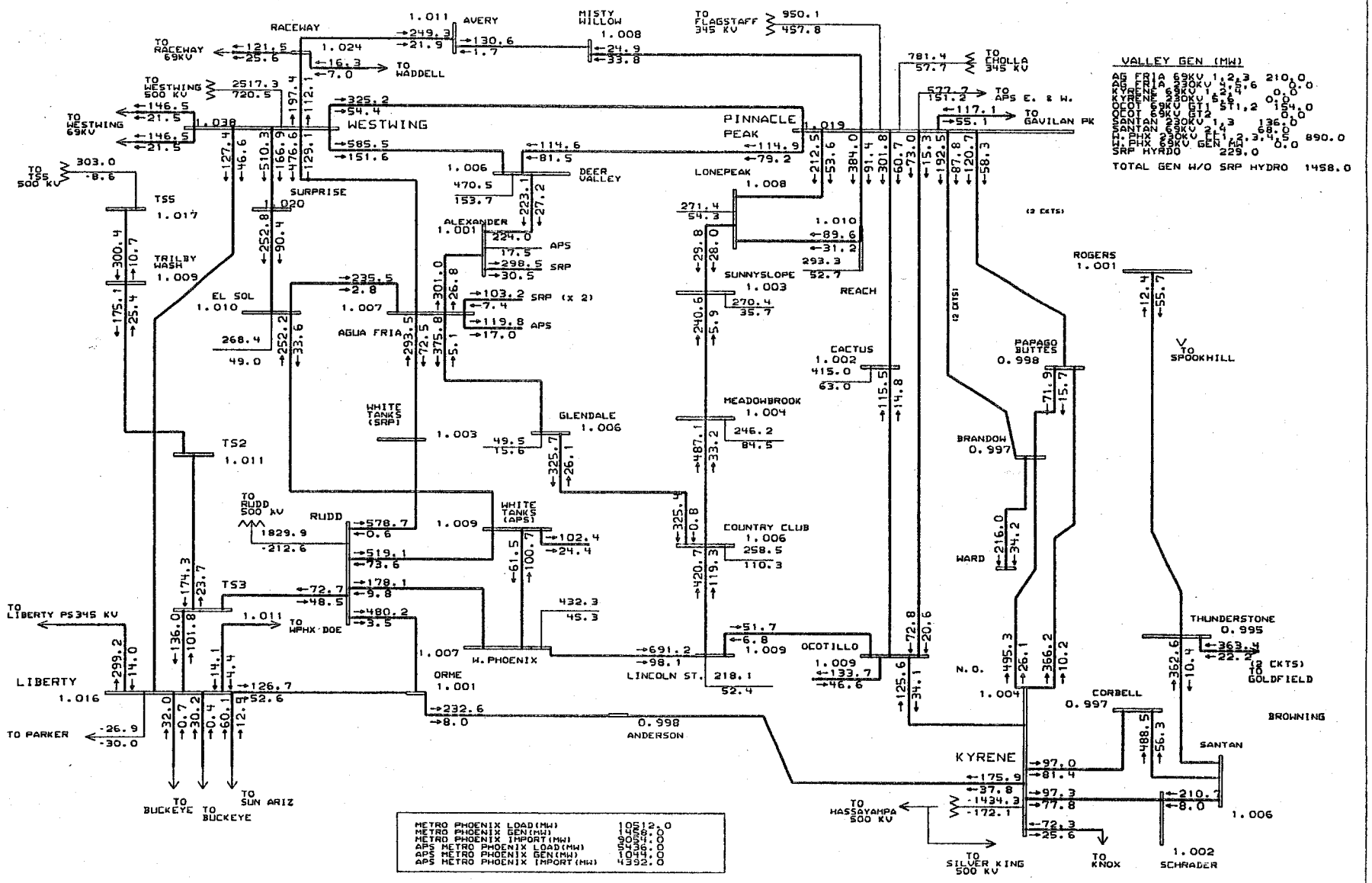
General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:34:00 2003

APS Transmission Planning

sev_hv_rev4.sav from sev_hv_rev3.sav modified 08/26/02
originally 06hs2sa.sav from WECC BB used for CATS EHV SUBCOM
2011

BASECASE N-0

ehv_2011.drv
smlfs14a.wrk
Rating = 2



PHOENIX AREA 230KV SYSTEM

General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:34:07 2003

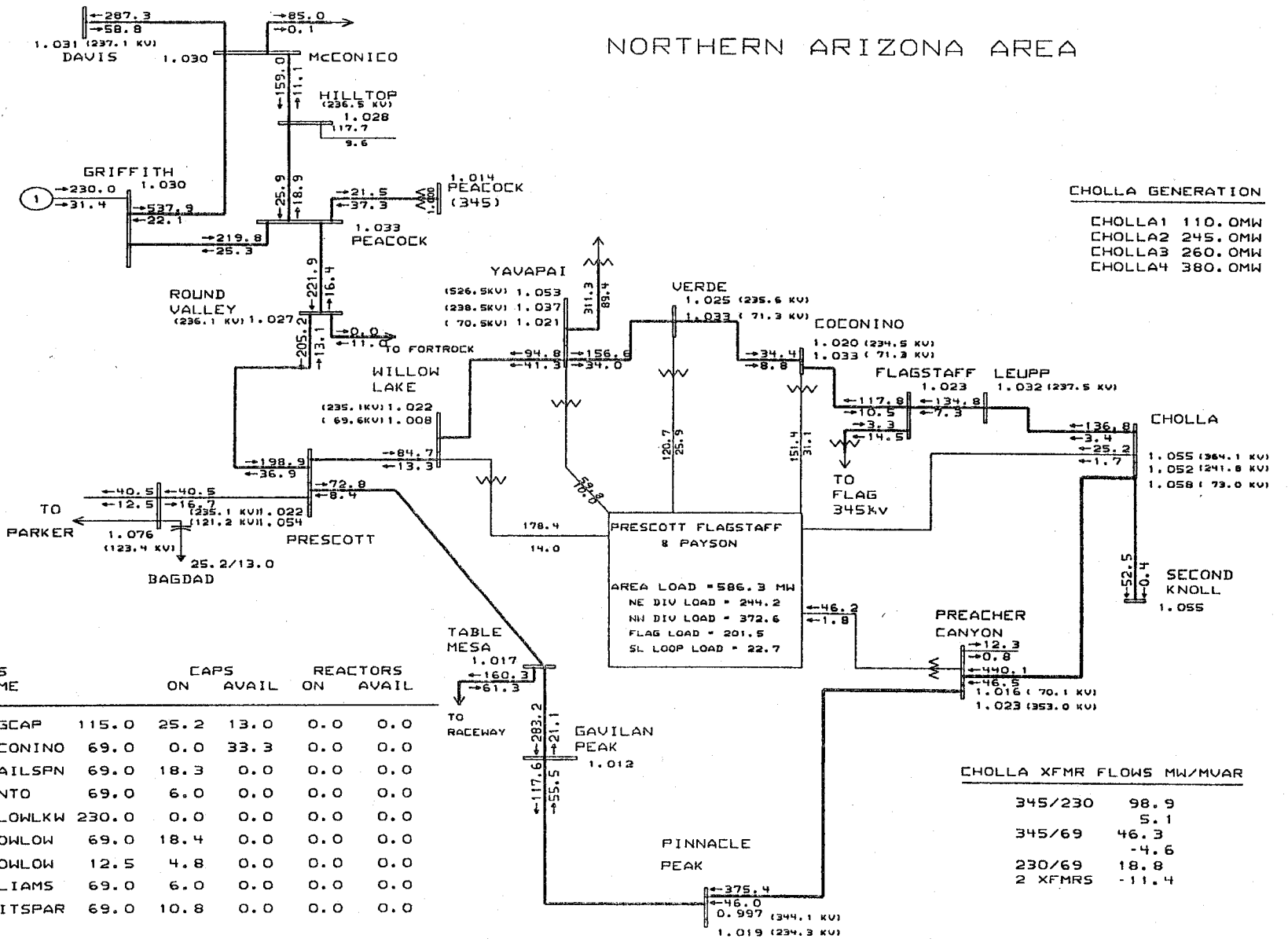
sev_hv_rev4.sav from sev_hv_rev3.sav modified 08/26/02
originally 06hs2sa.sav from WECC BB used for CATS EHV SUBCOM
2011

BASECASE N-0

met230_2011.drw
smll14a.wrk
Rating = 2

A 34

NORTHERN ARIZONA AREA



CHOLLA GENERATION

CHOLLA1	110.0MW
CHOLLA2	245.0MW
CHOLLA3	260.0MW
CHOLLA4	380.0MW

CHOLLA XFMR FLOWS MW/MVAR

345/230	98.9
	5.1
345/69	46.3
	-4.6
230/69	18.8
2 XFMRS	-11.4

BUS NAME		CAPS ON	CAPS AVAIL	REACTORS ON	REACTORS AVAIL
BAGCAP	115.0	25.2	13.0	0.0	0.0
COCONINO	69.0	0.0	33.3	0.0	0.0
QUAILSPN	69.0	18.3	0.0	0.0	0.0
TONTO	69.0	6.0	0.0	0.0	0.0
WILOWLKW	230.0	0.0	0.0	0.0	0.0
SHOWLOW	69.0	18.4	0.0	0.0	0.0
SHOWLOW	12.5	4.8	0.0	0.0	0.0
WILIAMS	69.0	6.0	0.0	0.0	0.0
WHITSPAR	69.0	10.8	0.0	0.0	0.0

General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:34:09 2003

APS Transmission Planning

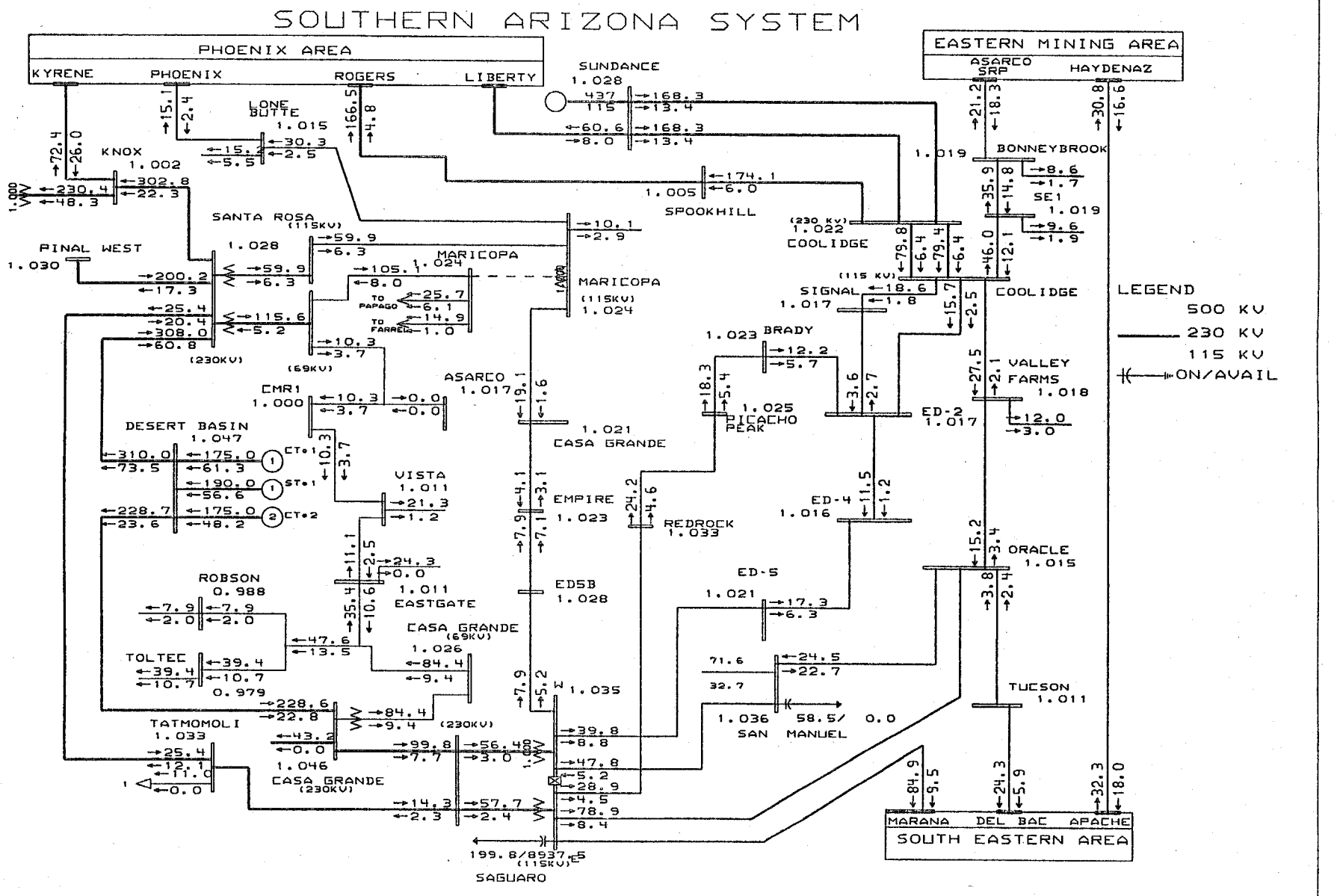
sev_hv_rev4.sav from sev_hv_rev3.sav modified 08/26/02
originally 06hs2sa.sav from WECC BB used for CATS EHV SUBCOM
2011

BASECASE N-0

no230_2011.drw
sm11e14a.wrk
Rating = 2

A 25

SOUTHERN ARIZONA SYSTEM

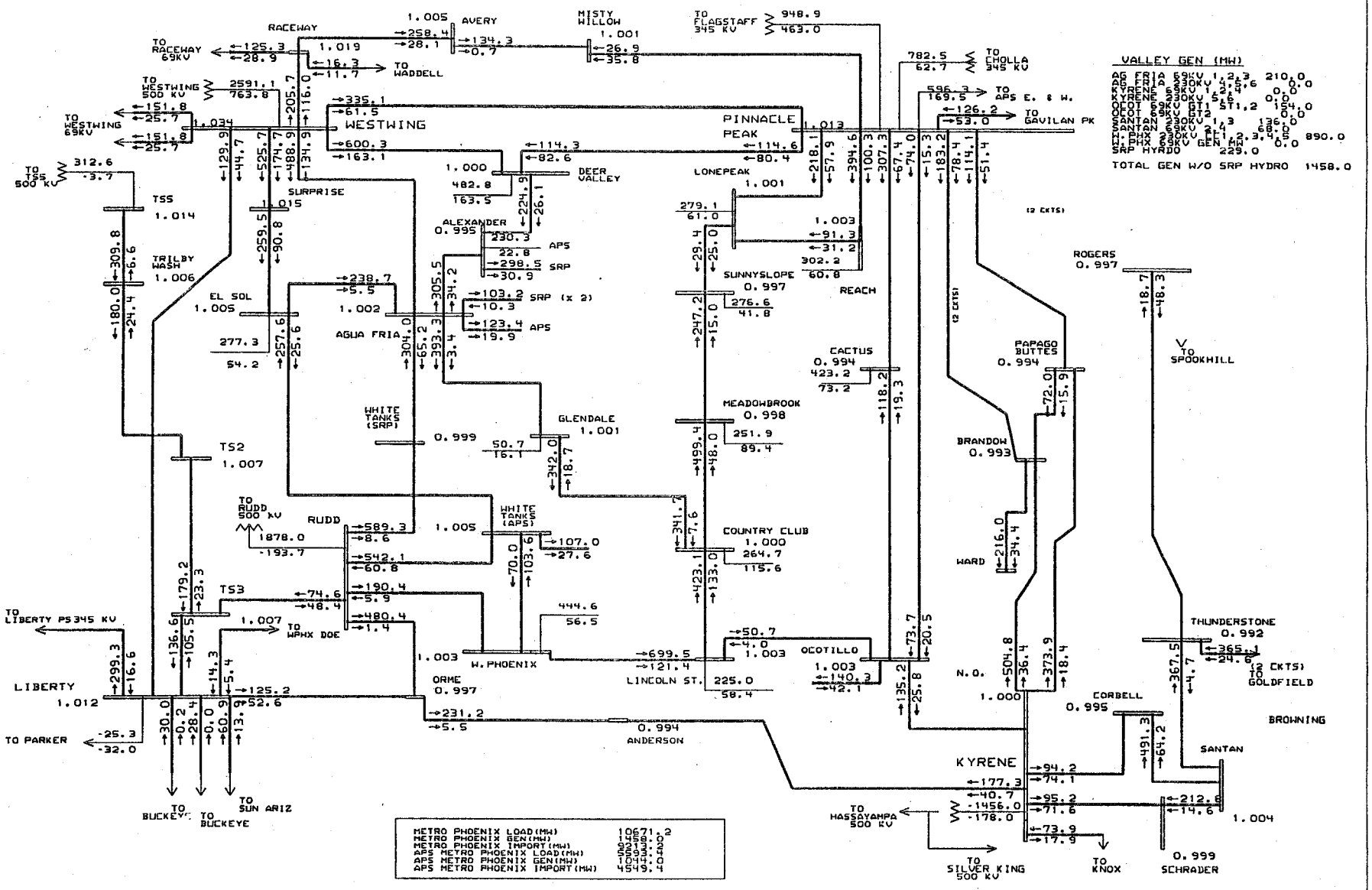


General Electric International, Inc. PSLF Program

MW/MVAR Tue Jan 21 07:34:15 2003

[redacted]smission [redacted]ning	sev_hv_rev4.sav from sev_hv_rev3.sav modified 08/26/02 originally 06hs2sa.sav from WECC BB used for CATS EHV SUBCOM 2011	BASECASE N-0	so230_2011.drw sm11:14a.wrk Rating = 2

A 36



PHOENIX AREA 230KV SYSTEM

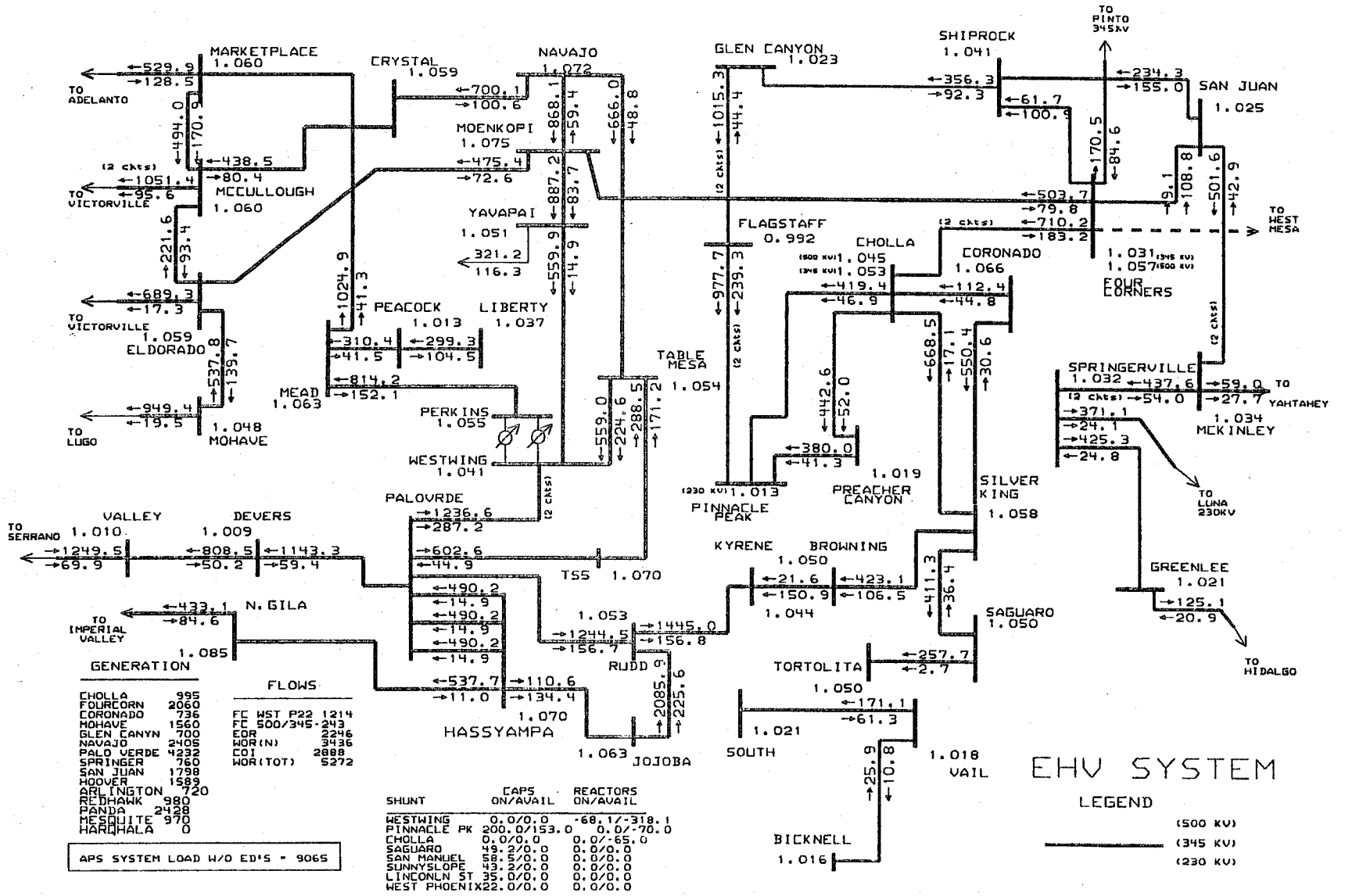
General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:34:39 2003

Transmission Planning

sev_hv_rev4.sav from sev_hv_rev3.sav modified 08/26/02
originally 06hs2sa.sav from WECC BB used for CATS EHV SUBCOM
2012

BASECASE N-0

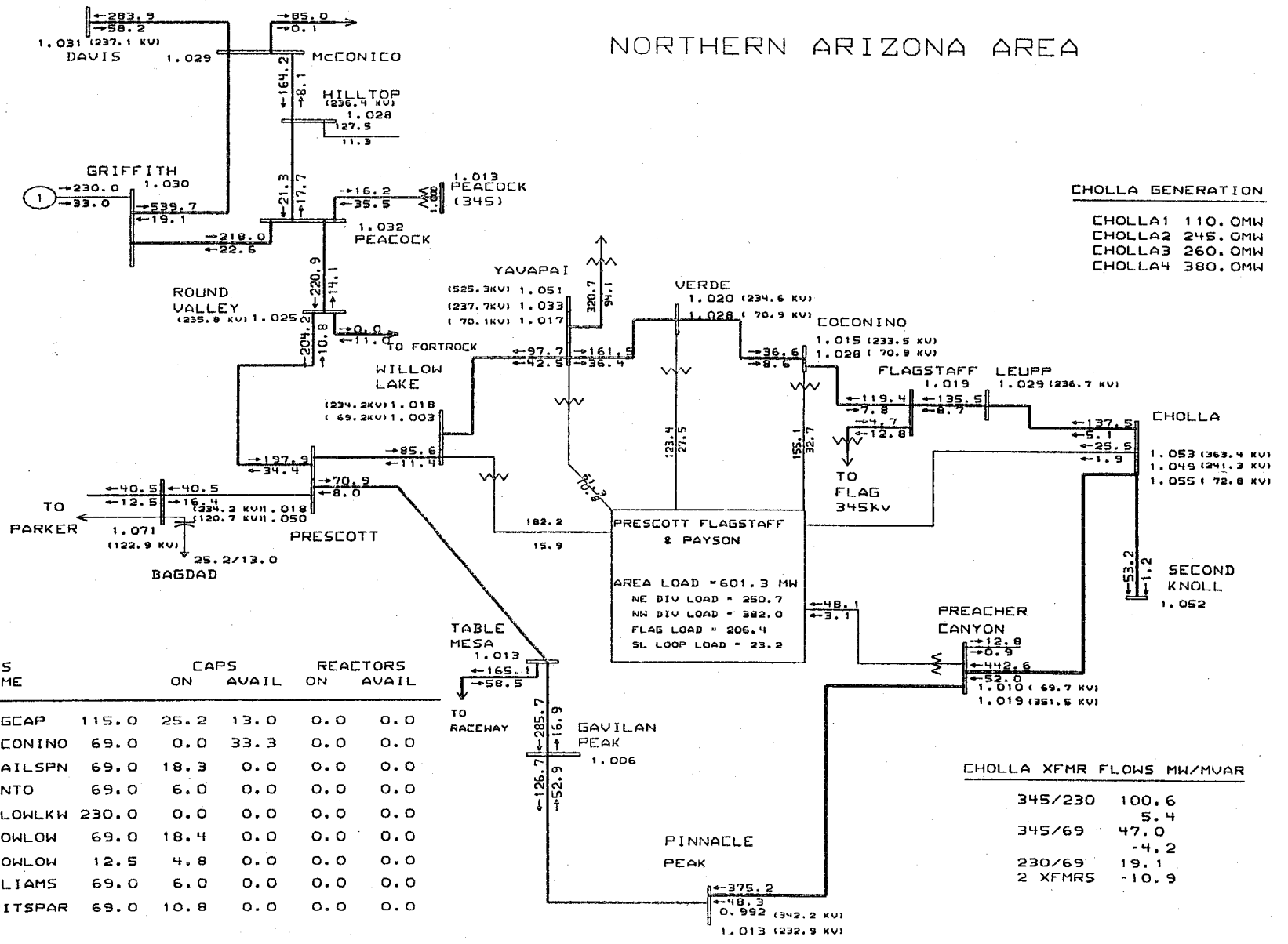
met230_2012.drw
sm12:06a.wrk
Rating = 2



General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:34:36 2003

APS Transmission Planning	sev_hv_rev4.sav from sev_hv_rev3.sav modified 08/26/02 originally 06hs2sa.sav from WECC BB used for CATS EHV SUBCOM 2012	BASECASE N-0	ehv_2012.drw sm12:06a.wrk Rating = 2

NORTHERN ARIZONA AREA



CHOLLA GENERATION

CHOLLA1	110.0MW
CHOLLA2	245.0MW
CHOLLA3	260.0MW
CHOLLA4	380.0MW

CHOLLA XFMR FLOWS MW/MVAR

345/230	100.6	
		5.4
345/69	47.0	
		-4.2
230/69	19.1	
2 XFMRS	-10.9	

BUS NAME		CAPS ON	CAPS AVAIL	REACTORS ON	REACTORS AVAIL
BAGCAP	115.0	25.2	13.0	0.0	0.0
COCONINO	69.0	0.0	33.3	0.0	0.0
QUAILSPN	69.0	18.3	0.0	0.0	0.0
TONTO	69.0	6.0	0.0	0.0	0.0
WILOWLKW	230.0	0.0	0.0	0.0	0.0
SHOWLOW	69.0	18.4	0.0	0.0	0.0
SHOWLOW	12.5	4.8	0.0	0.0	0.0
WILIAMS	69.0	6.0	0.0	0.0	0.0
WHITSPAR	69.0	10.8	0.0	0.0	0.0

General Electric International, Inc. PSLF Program MW/MVAR Tue Jan 21 07:34:45 2003

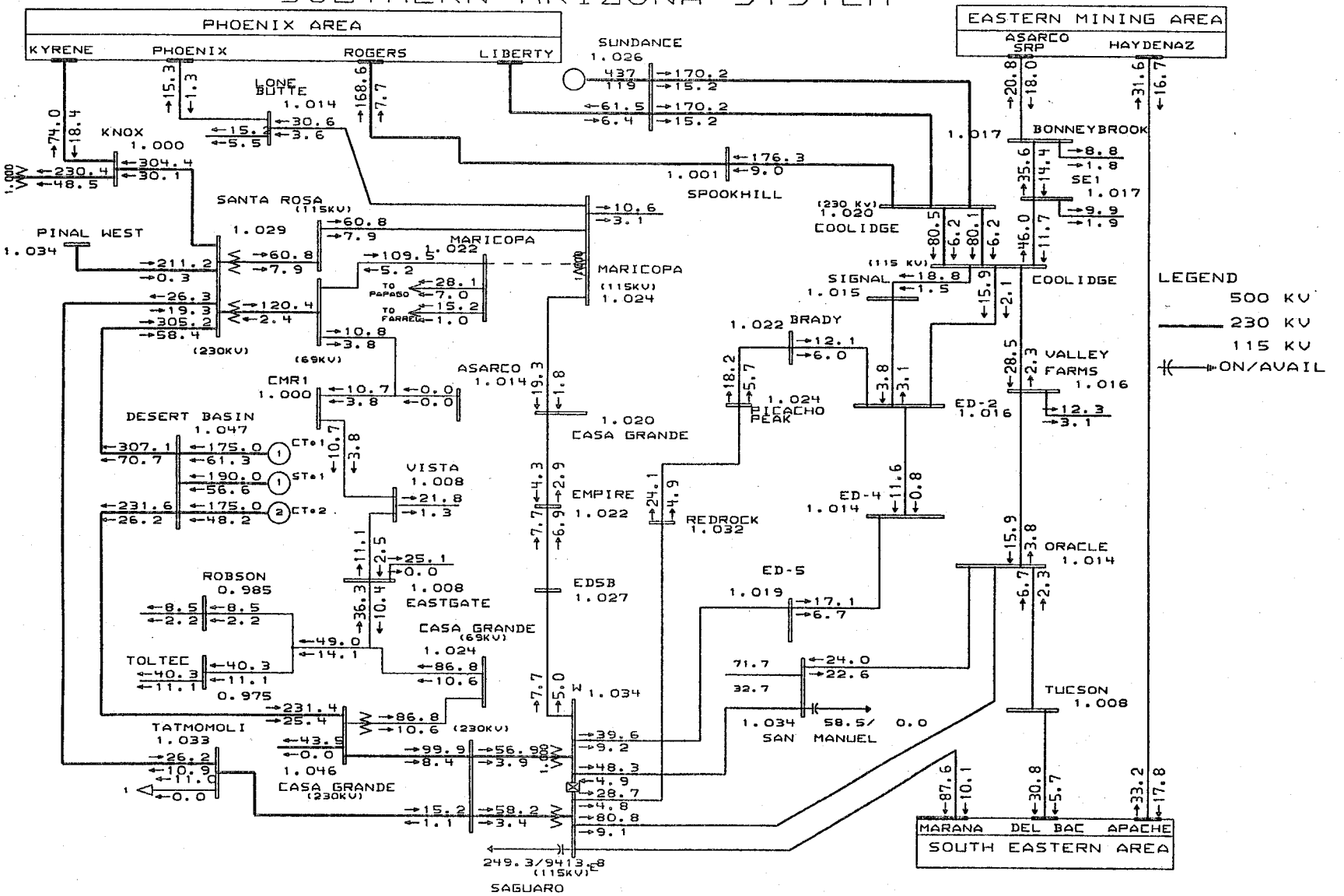
APS Transmission Planning

sev_hv_rev4.sav from sev_hv_rev3.sav modified 08/26/02
originally 06hs2sa.sav from WECC BB used for CATS EHV SUBCOM
2012

BASECASE N-0

no230_2012.drw
sm12s06a.wrk
Rating = 2

SOUTHERN ARIZONA SYSTEM



General Electric International, Inc. PSLF Program

MW/MVAR Tue Jan 21 07:34:50 2003

[redacted]smission [redacted]ning

sev_hv_rev4.sav from sev_hv_rev3.sav modified 08/26/02
originally 06hs2sa.sav from WECC BB used for CATS EHV SUBCOM
2012

BASECASE N-0

so230_2012.drw
sm12:06a.wrk
Rating = 2

A40

APPENDIX B

2003
Stability Plots

Table of Contents

Simulation **Page**

Cholla 345kv
- Cholla-Four Corners outage B1-B5
- Cholla-Pinnacle Peak outage B6-B10

Cholla 500kv
- Cholla-Coronado outage B11-B15
- Cholla-Saguaro outage B16-B20

Four Corners 345kv
- Four Corners-Cholla outage B21-B25

Four Corners 500kv
- Four Corners-Moenkopi outage B26-B30

Jojoba 500kv
- Jojoba- Palo Verde outage B31-B35
- Jojoba-Kyrene outage B36-B40

Kyrene 500kv
- Kyrene-Jojoba outage B41-B45
- Kyrene-Browning outage B46-B50

Moenkopi 500kv
- Moenkopi-Eldorado outage B51-B55
- Moenkopi-Yavapai outage B56-B60

Navajo 500kv
- Navajo-Crystal outage B61-B65
- Navajo-Moenkopi outage B66-B70
- Navajo-Westwing outage B71-B75

North Gila 500kv
- North Gila-Hassayampa outage B76-B80
- North Gila-Imperial Valley outage B81-B85

Palo Verde 500kv
- Palo Verde-Devers outage B86-B90
- Palo Verde-Jojoba outage B91-B95
- Palo Verde-North Gila outage B96-B100
- Palo Verde-Rudd outage B101-B105
- Palo Verde-Westwing outage B106-B110

Perkins 500kv
- Perkins-Mead outage B111-B115

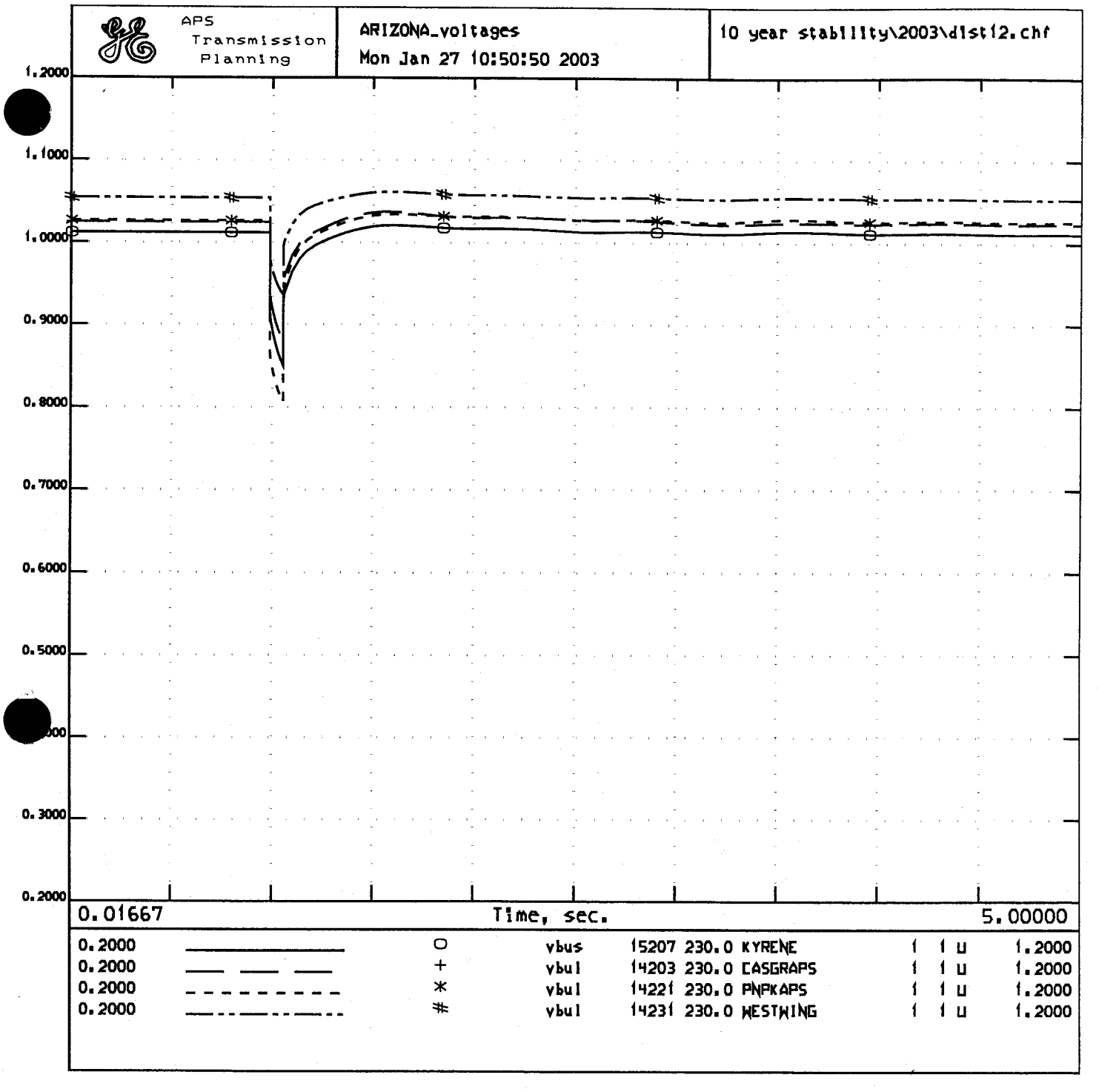
Pinnacle Peak 345kv
- Pinnacle Peak-Cholla outage B116-B120

Rudd 500kv
- Rudd-Palo Verde outage B121-B125

Saguaro 500kv
- Saguaro-Cholla outage B126-B130

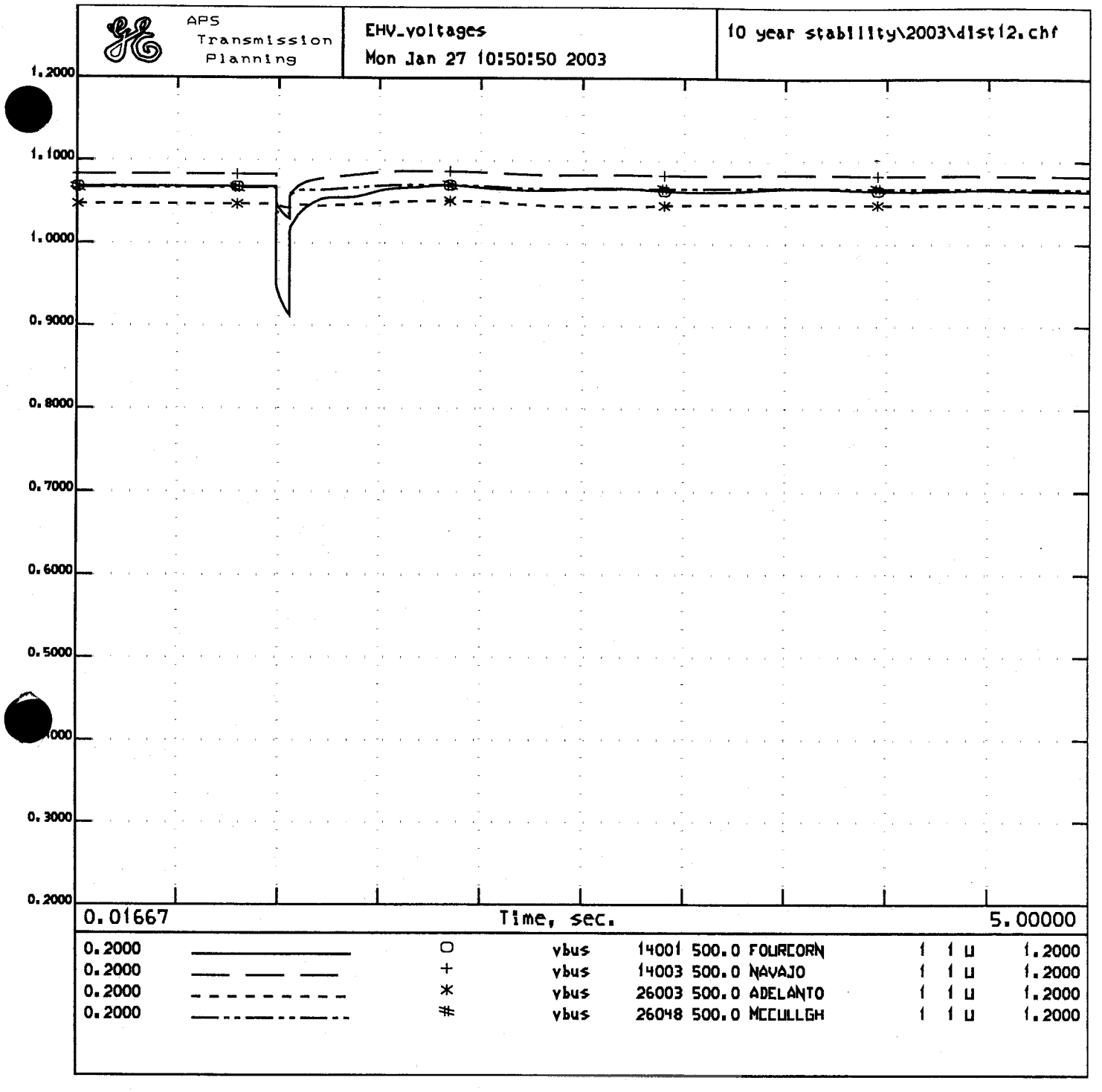
Westwing 500kv
- Westwing-Navajo outage B131-B135
- Westwing-Palo Verde outage B136-B140
- Westwing-Yavapai outage B141-B145

Yavapai 500kv
- Yavapai-Moenkopi outage B146-B150
- Yavapai-Westwing outage B151-B155



CHOLLA FLT CH-FC LINE OUT!
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
CHO-FC #1 STAB; 01/03; T=0 3P FLT CHO345;FLSH FCN-CHO CAPS;
4C CLR FLT W/CHO-FC #1;2003.dyd;WSCC.bpt

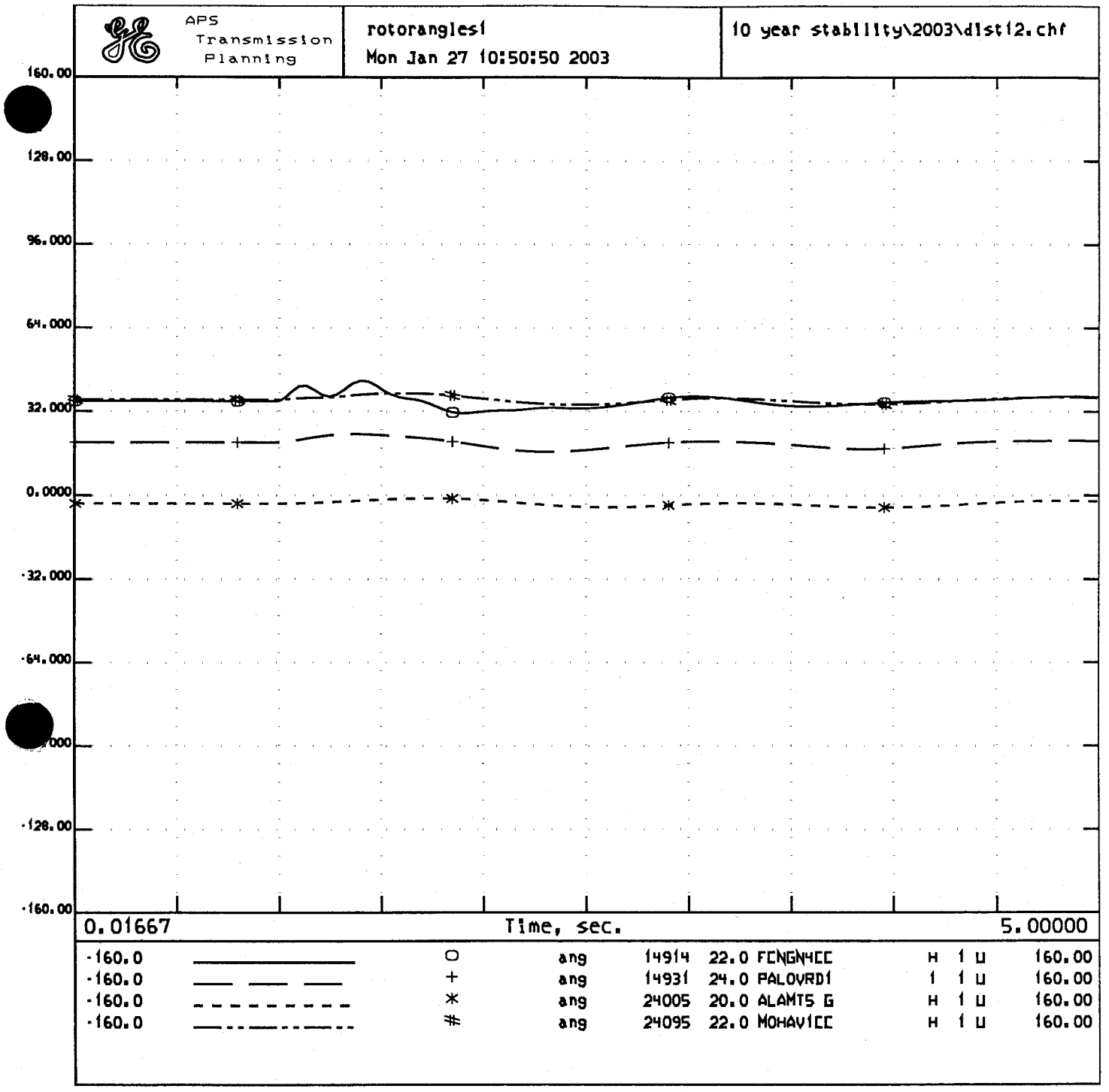
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



CHOLLA FLT CH-FC LINE OUT!
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
CHO-FC #1 STAB! 01/03! T=0 3P FLT CHO345!FLSH FCN-CHO CAPS!
4C CLR FLT W/CHO-FC #1!2003.dyd!WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

B2



CHOLLA FLT CH-FC LINE OUT!
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
CHO-FC #1 STAB; 01/03; T=0 3P FLT CH0345;FLSH FCN-CHO CAPS;
4C CLR FLT W/CHO-FC #1;2003.dyd;WSCC.bpt

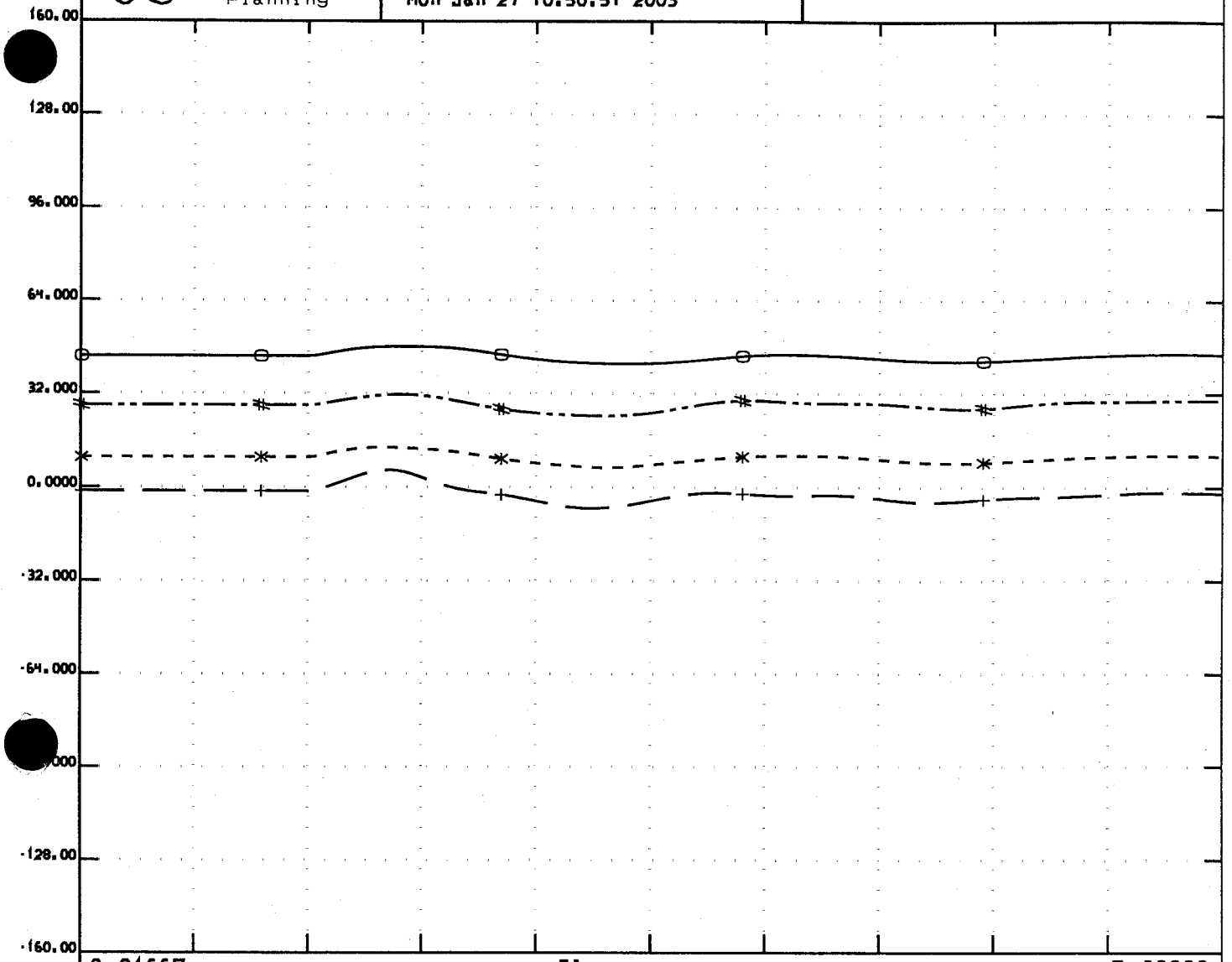
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

B3

APS Transmission Planning

rotorangles2
Mon Jan 27 10:50:51 2003

10 year stability\2003\dist12.chf



0.01667 Time, sec. 5.00000

-160.0	————	O	ang	15981	26.0	NAVAJO 1	1	1	u	160.00
-160.0	— — —	+	ang	14941	15.5	SAGUARO1	1	1	u	160.00
-160.0	- - - - - - - - -	*	ang	14951	13.8	WPHX CC1	1	1	u	160.00
-160.0	—-—-—-—	#	ang	14987	18.0	DBG-CT1	1	1	u	160.00

CHOLLA FLT CH-FC LINE OUT!
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
CHO-FC #1 STAB! 01/03! T=0 3P FLT CH0345!FLSH FCN-CHO CAPS!
4C CLR FLT W/CHO-FC #1!2003.dyd!WSCC.bpt

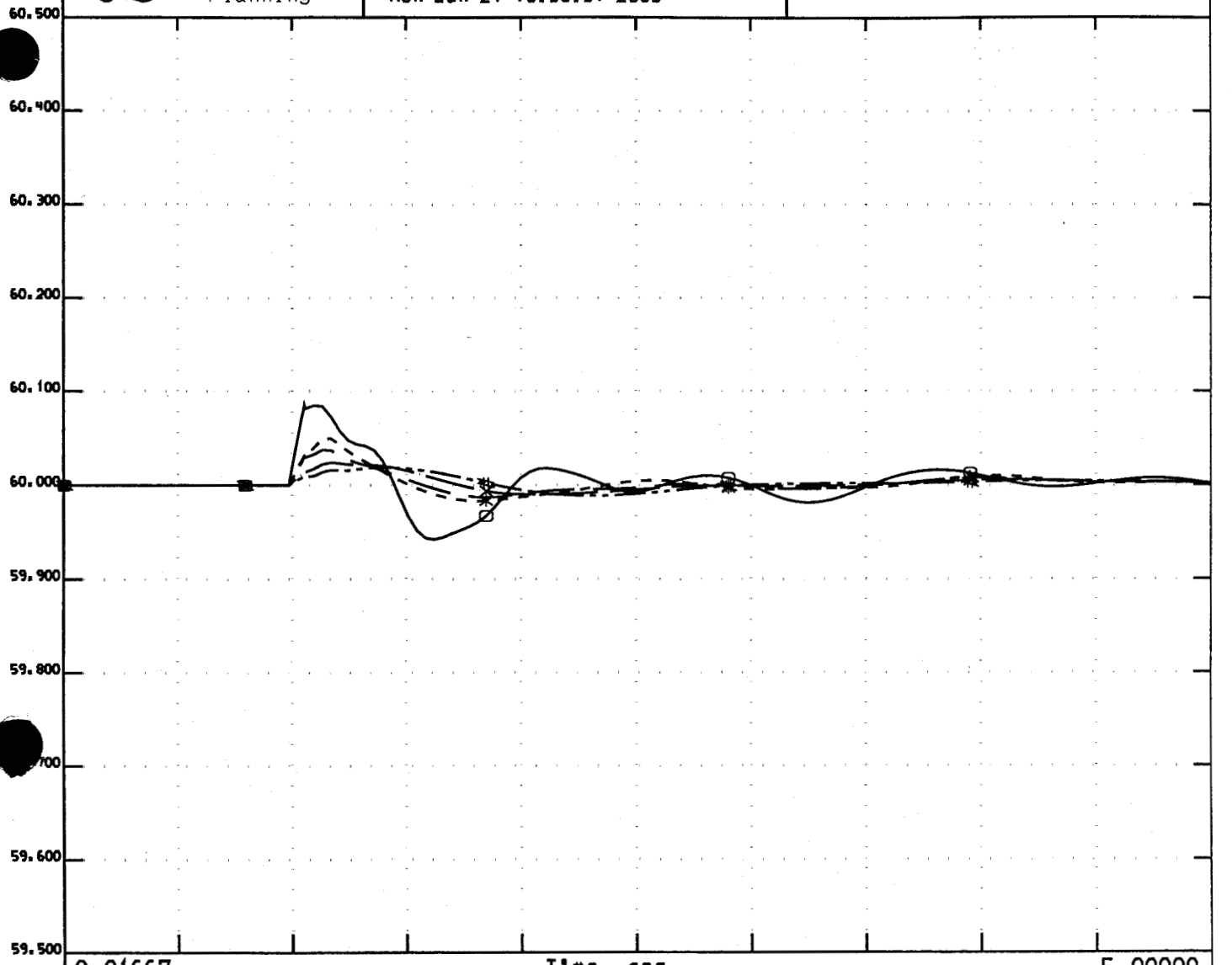
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

B4

APS Transmission Planning

frequencies
Mon Jan 27 10:50:51 2003

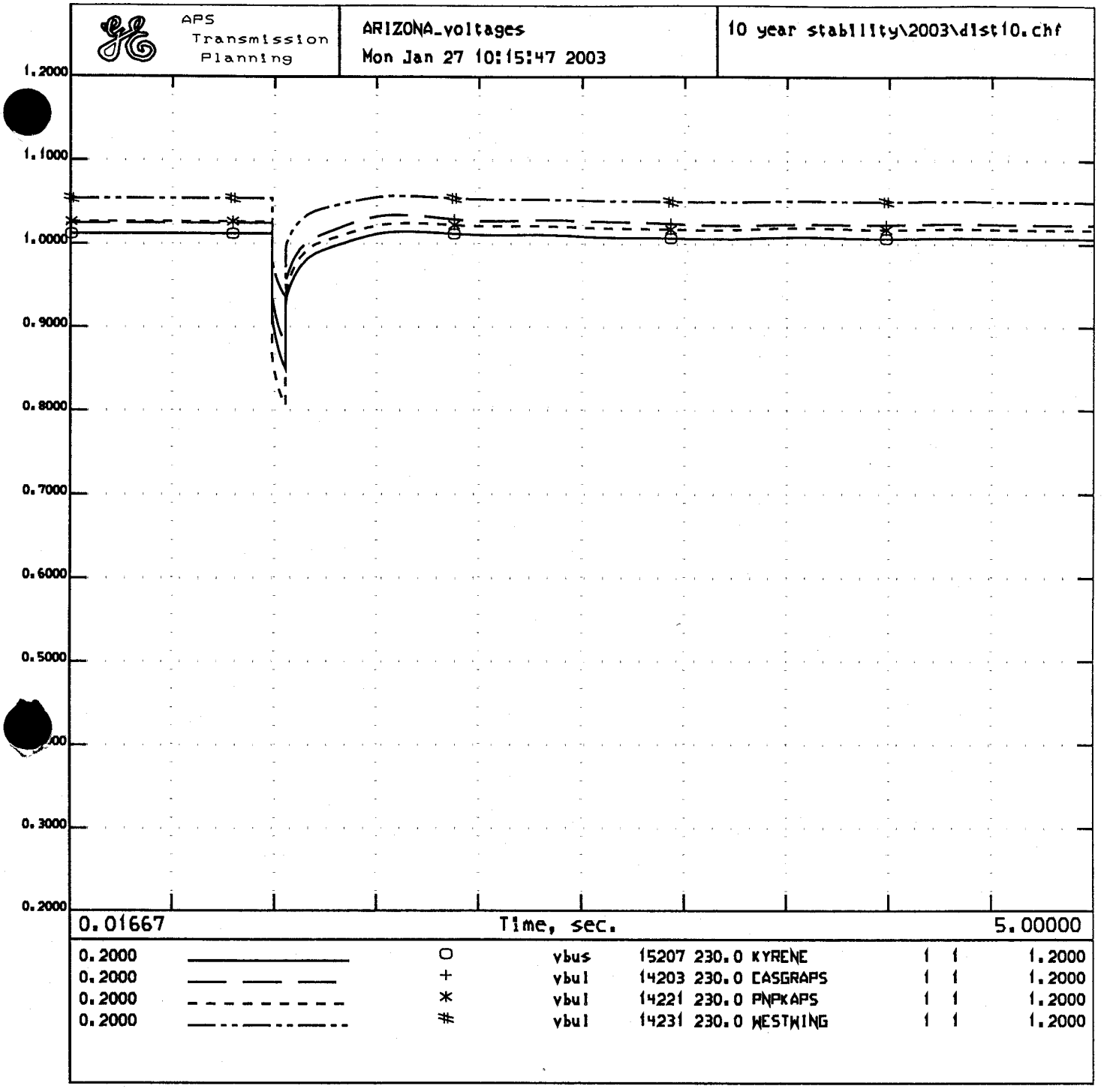
10 year stability\2003\dist12.chf



59.500	————	O	fbus	14001	500.0	FOURCORN	1	1 u	60.500
59.500	— — —	+	fbus	14003	500.0	NAVAJO	1	1 u	60.500
59.500	- - - - - - - - -	*	fbul	14231	230.0	WESTWING	1	1 u	60.500
59.500	—— - - —— - - —— - -	#	fbus	26003	500.0	ADELANTO	1	1 u	60.500
59.500	—— . —— . ——	X	fbus	26048	500.0	MCCULLGH	1	1 u	60.500

CHOLLA FLT CH-FC LINE OUT!
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
CHO-FC #1 STAB; 01/03; T=0 3P FLT CHO345;FLSH FCN-CHO CAPS;
4C CLR FLT W/CHO-FC #1;2003.dyd;WSCC.bpt

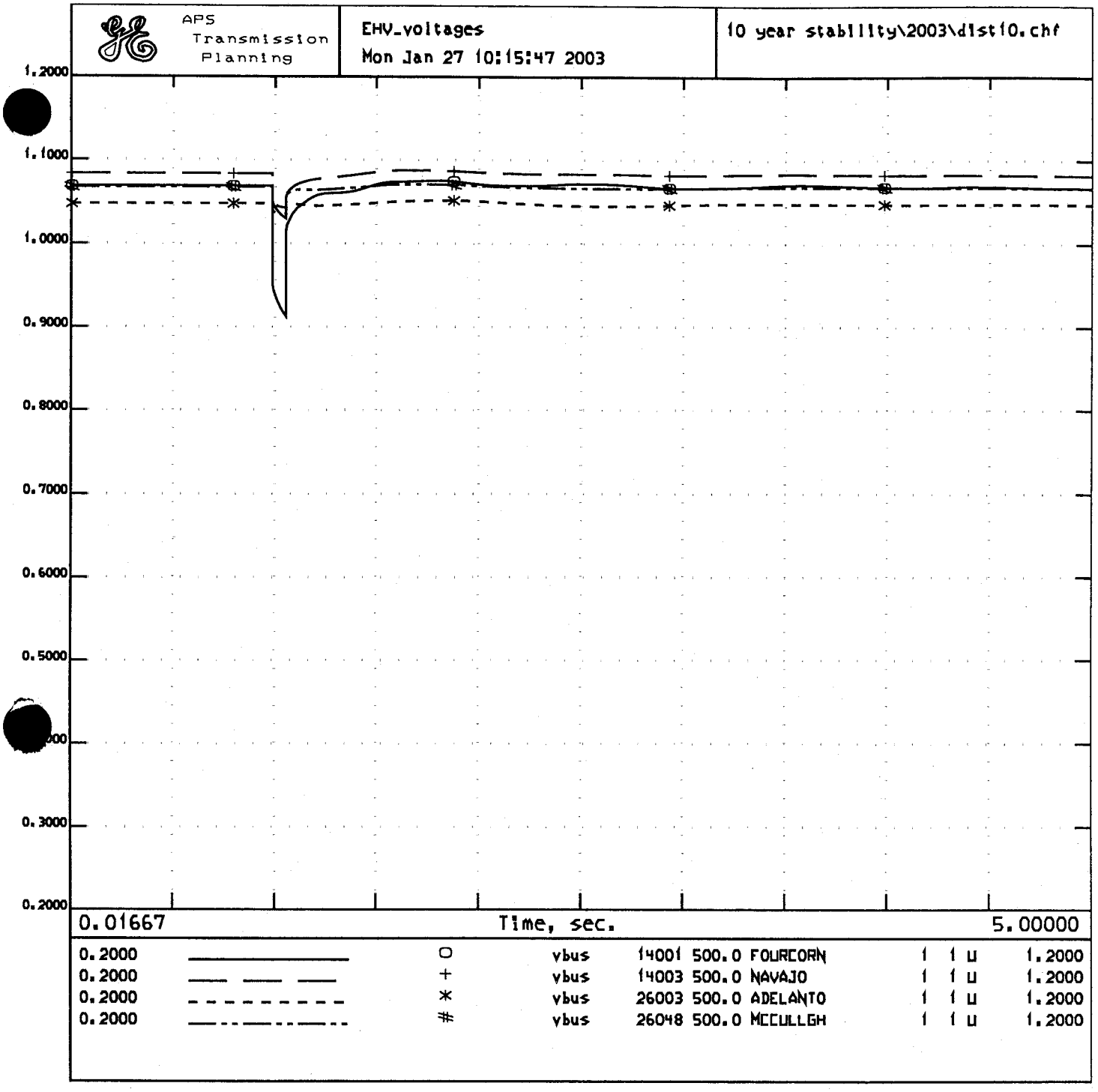
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



CHOLLA FLT CH-PPK LINE OUT!
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
CHO-PPK #1 STAB! 01/03! T=0 3P FLT CHO345!FLSH FCN-CHO CAPS!
4C CLR FLT W/CHO-PPK #1!8C REIN CAPS!2003.dyd!WSCC.bpt

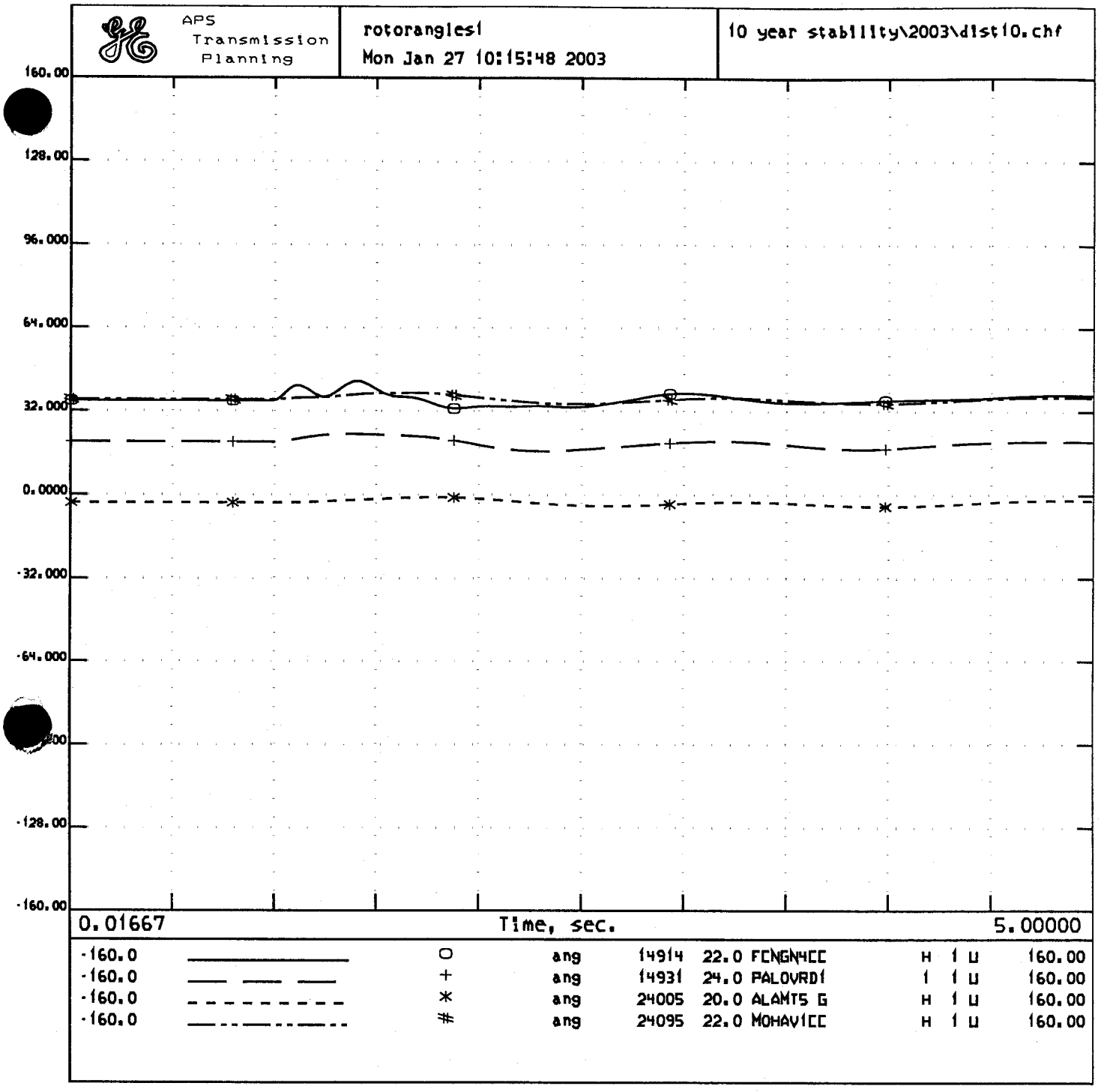
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

B6



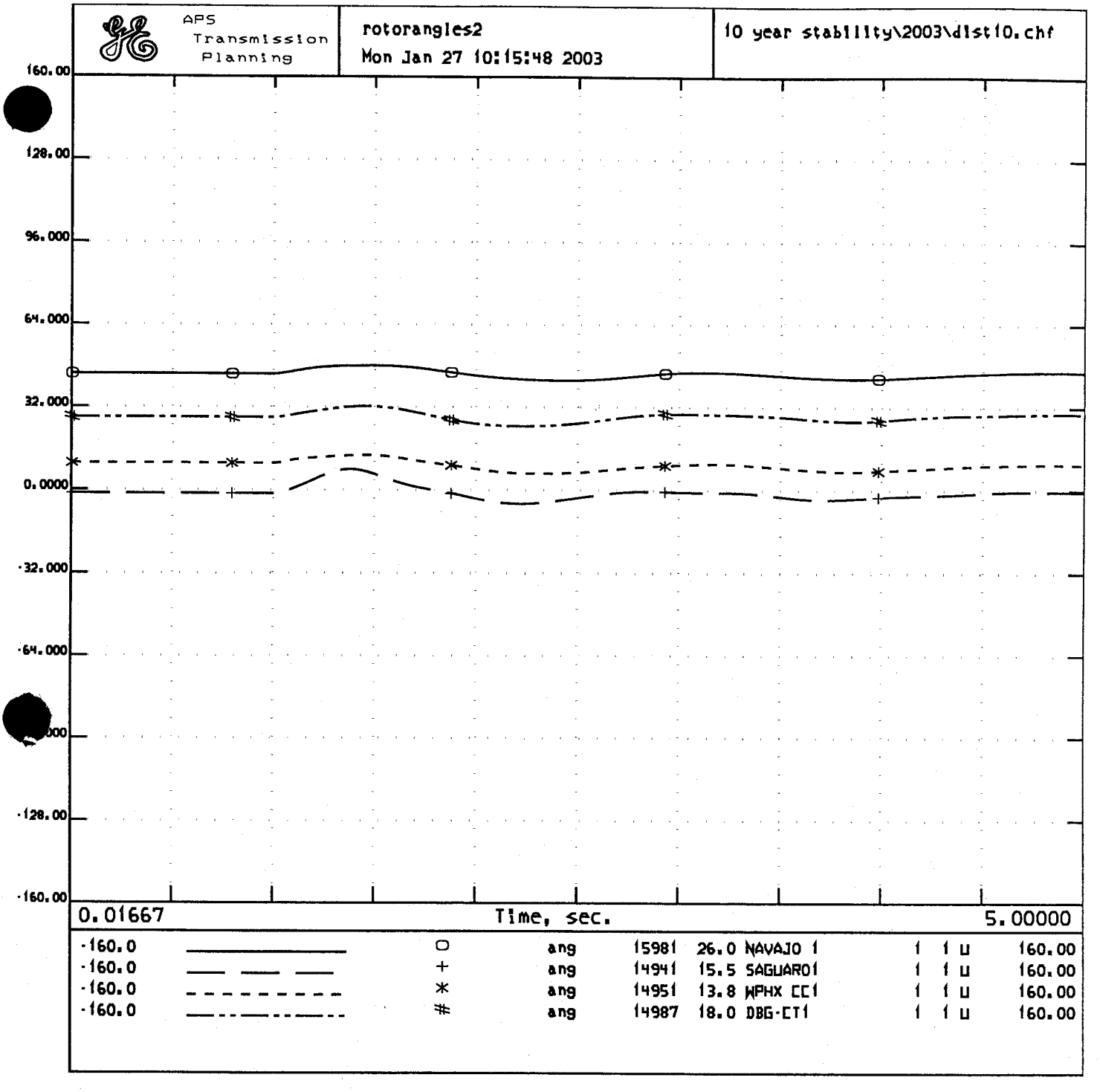
CHOLLA FLT CH-PPK LINE OUT!
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
CHO-PPK #1 STAB! 01/03! T=0 3P FLT CHO345!FLSH FCN-CHO CAPS!
4C CLR FLT W/CHO-PPK #1!8C REIN CAPS!2003.dyd!WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



CHOLLA FLT CH-PPK LINE OUT!
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
CHO-PPK #1 STAB! 01/03! T=0 3P FLT CHO345!FLSH FCN-CHO CAPS!
4C CLR FLT W/CHO-PPK #1!8C REIN CAPS!2003.dyd!WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



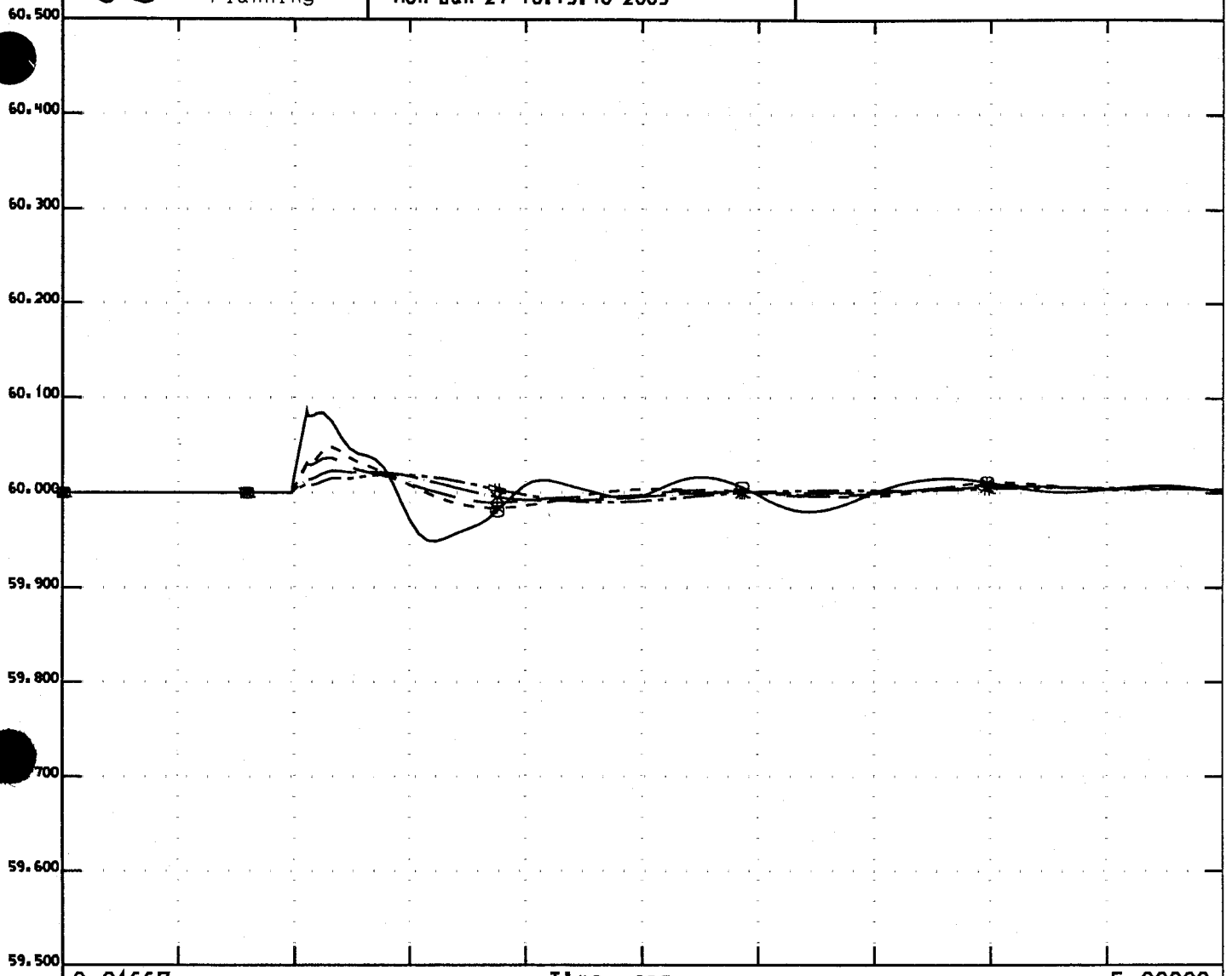
CHOLLA FLT CH-PPK LINE OUT!
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
CHO-PPK #1 STAB! 01/03! T=0 3P FLT CHO345!FLSH FCN-CHO CAPS!
4C CLR FLT W/CHO-PPK #1!8C REIN CAPS!2003.dyd!WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

APS Transmission Planning

frequencies
Mon Jan 27 10:15:48 2003

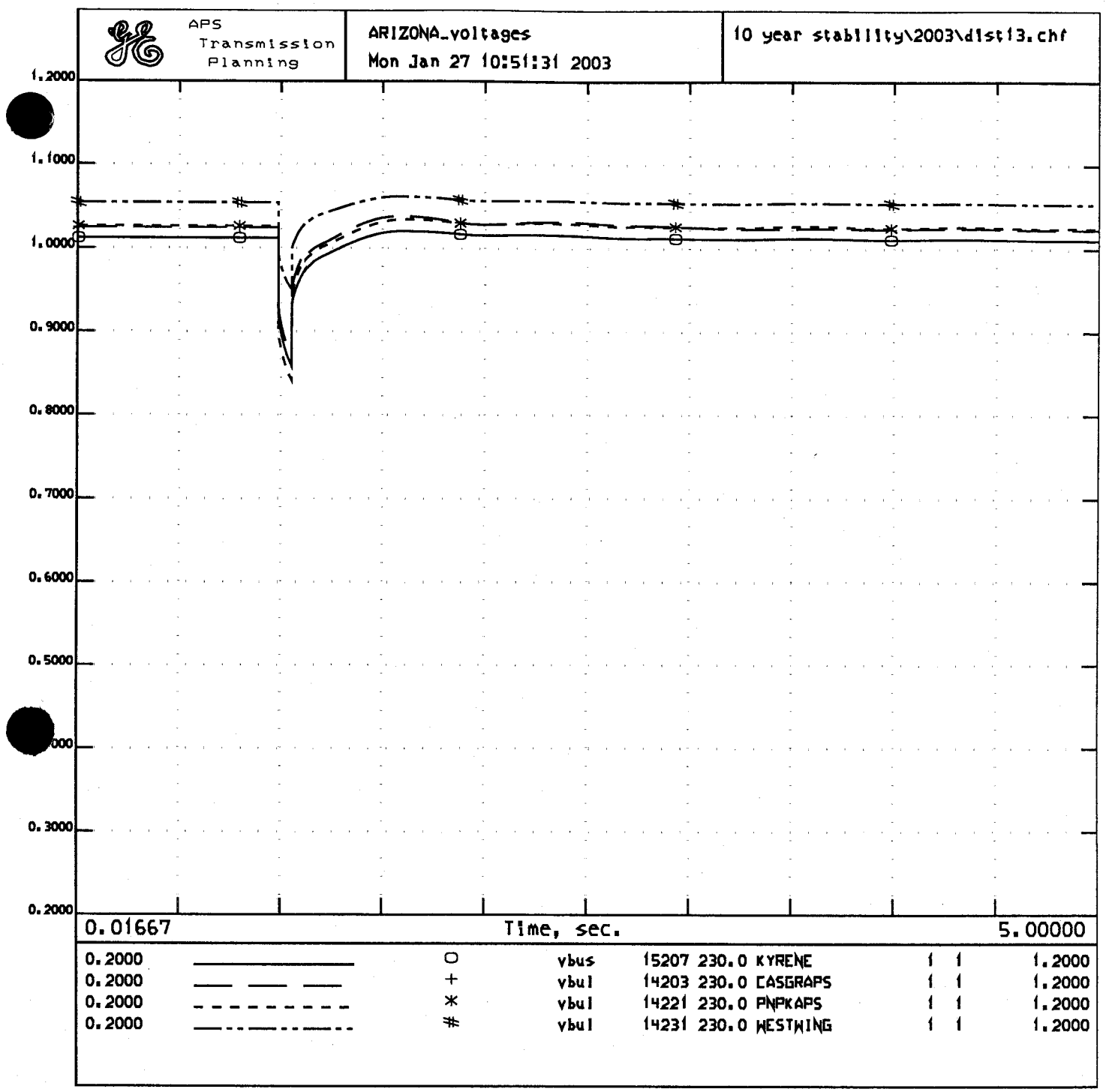
10 year stability\2003\dist10.chf



59.500	————	○	fbus	14001	500.0	FOURCORN	1	1 u	60.500
59.500	— — —	+	fbus	14003	500.0	NAVAJO	1	1 u	60.500
59.500	- - - - - - - - -	✳	fbul	14231	230.0	WESTWING	1	1 u	60.500
59.500	—··—··—··—	#	fbus	26003	500.0	ADELANTO	1	1 u	60.500
59.500	— — —	×	fbus	26048	500.0	MCCULLGH	1	1 u	60.500

CHOLLA FLT CH-PPK LINE OUT!
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
CHO-PPK #1 STAB; 01/03; T=0 3P FLT CHO345;FLSH FCN-CHO CAPS;
4C CLR FLT W/CHO-PPK #1;8C REIN CAPS;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



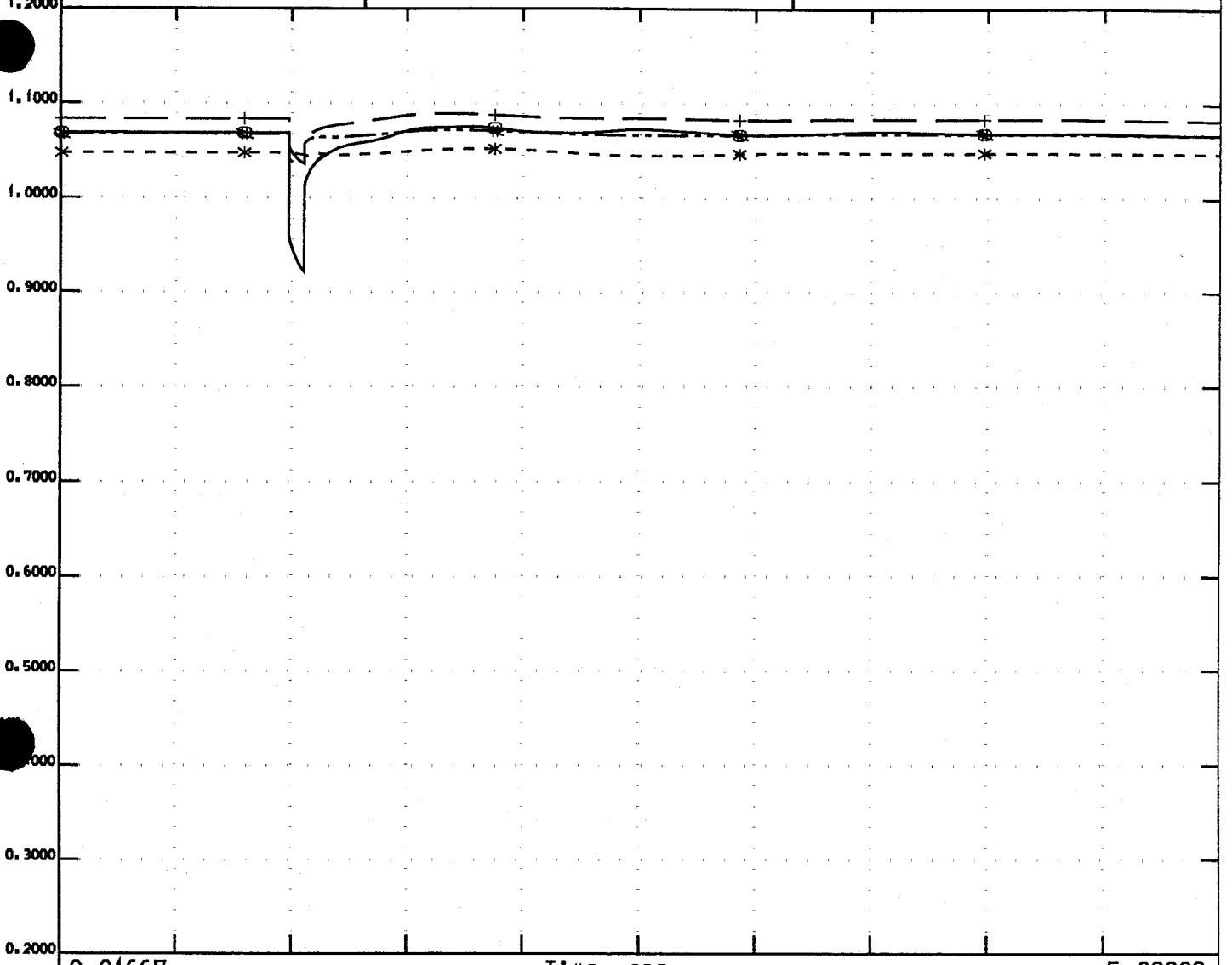
CHOLLA 500KV FLT CH-COR LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
CHO-COR STAB; 1/03; T=0 3P FLT CHO500;4C CLR FLT
W/CHO-COR;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

APS Transmission Planning

EHV_voltages
Mon Jan 27 10:51:31 2003

10 year stability\2003\dist13.chf

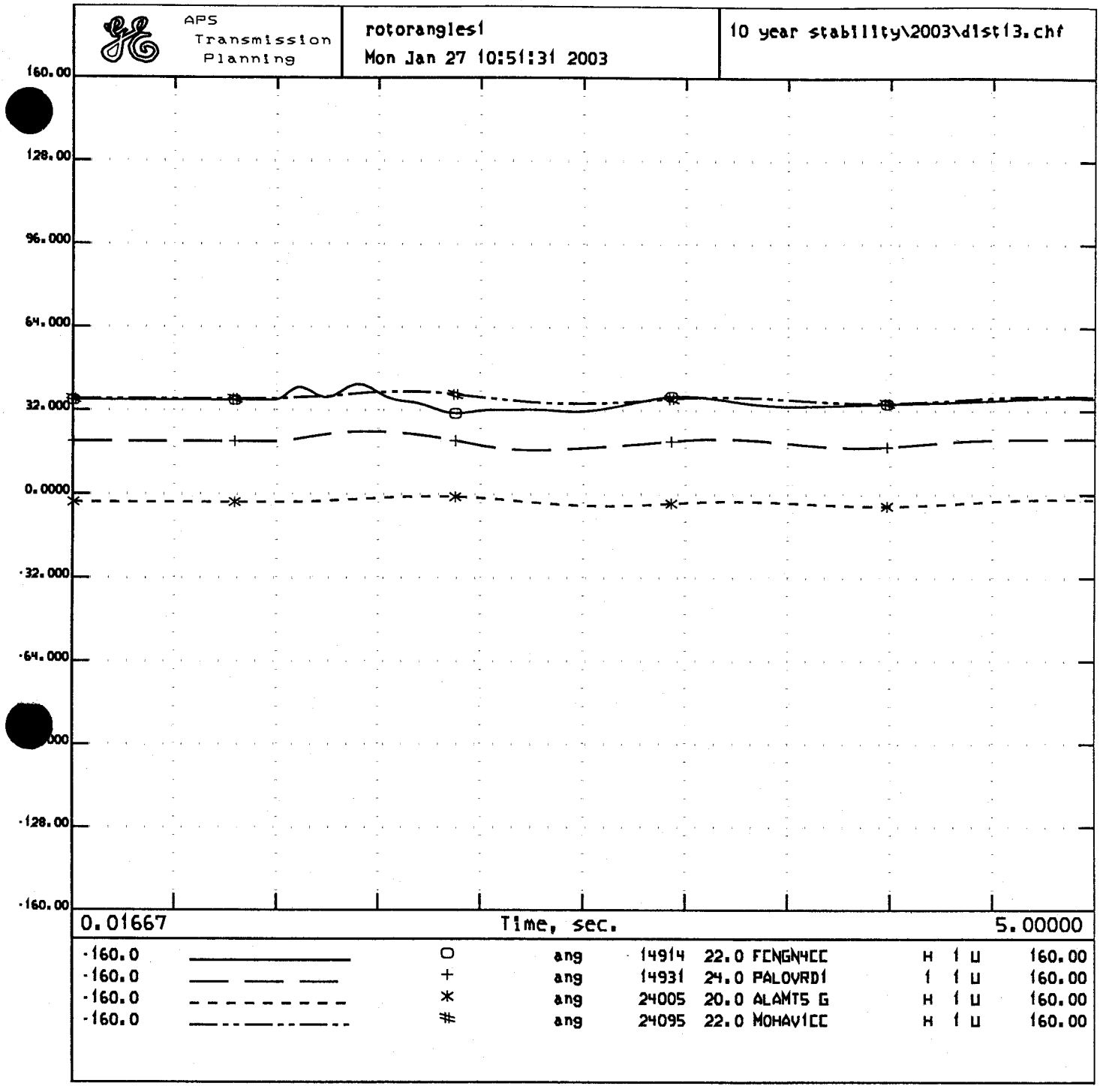


0.01667 Time, sec. 5.00000

0.2000	————————	O	vbus	14001	500.0	FOURCORN	1	1 u	1.2000
0.2000	— — —	+	vbus	14003	500.0	NAVAJO	1	1 u	1.2000
0.2000	- - - - - - - - -	*	vbus	26003	500.0	ADELANTO	1	1 u	1.2000
0.2000	—— - - —— - - —— - -	#	vbus	26048	500.0	MCCULLGH	1	1 u	1.2000

CHOLLA 500KV FLT CH-COR LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
CHO-COR STAB; 1/03; T=0 3P FLT CHO500;4C CLR FLT
W/CHO-COR;2003.dyd;WSCC.bpt

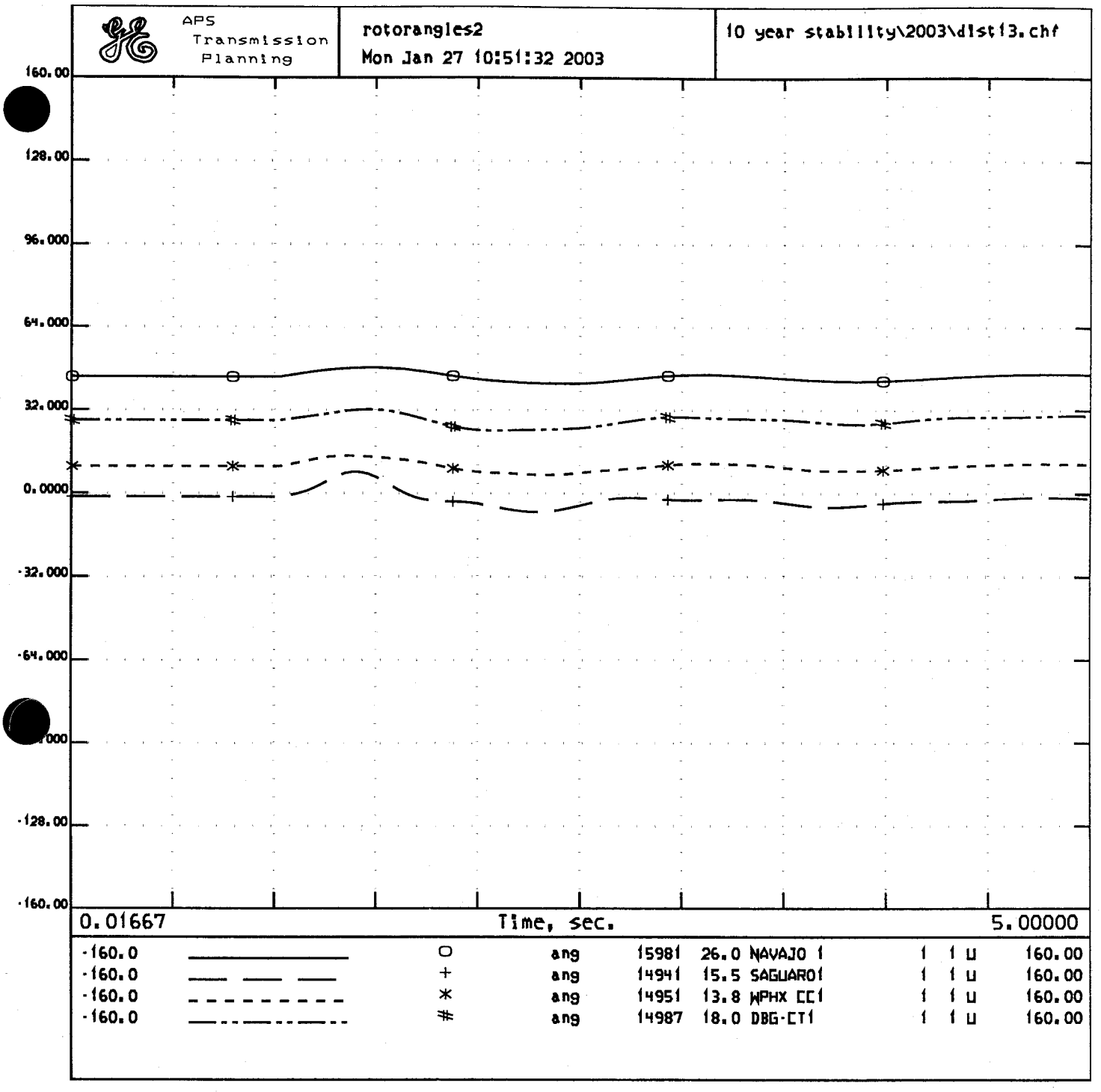
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



CHOLLA 500KV FLT CH-COR LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
CHO-COR STAB; 1/03; T=0 3P FLT CHO500;4C CLR FLT
W/CHO-COR;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

B13



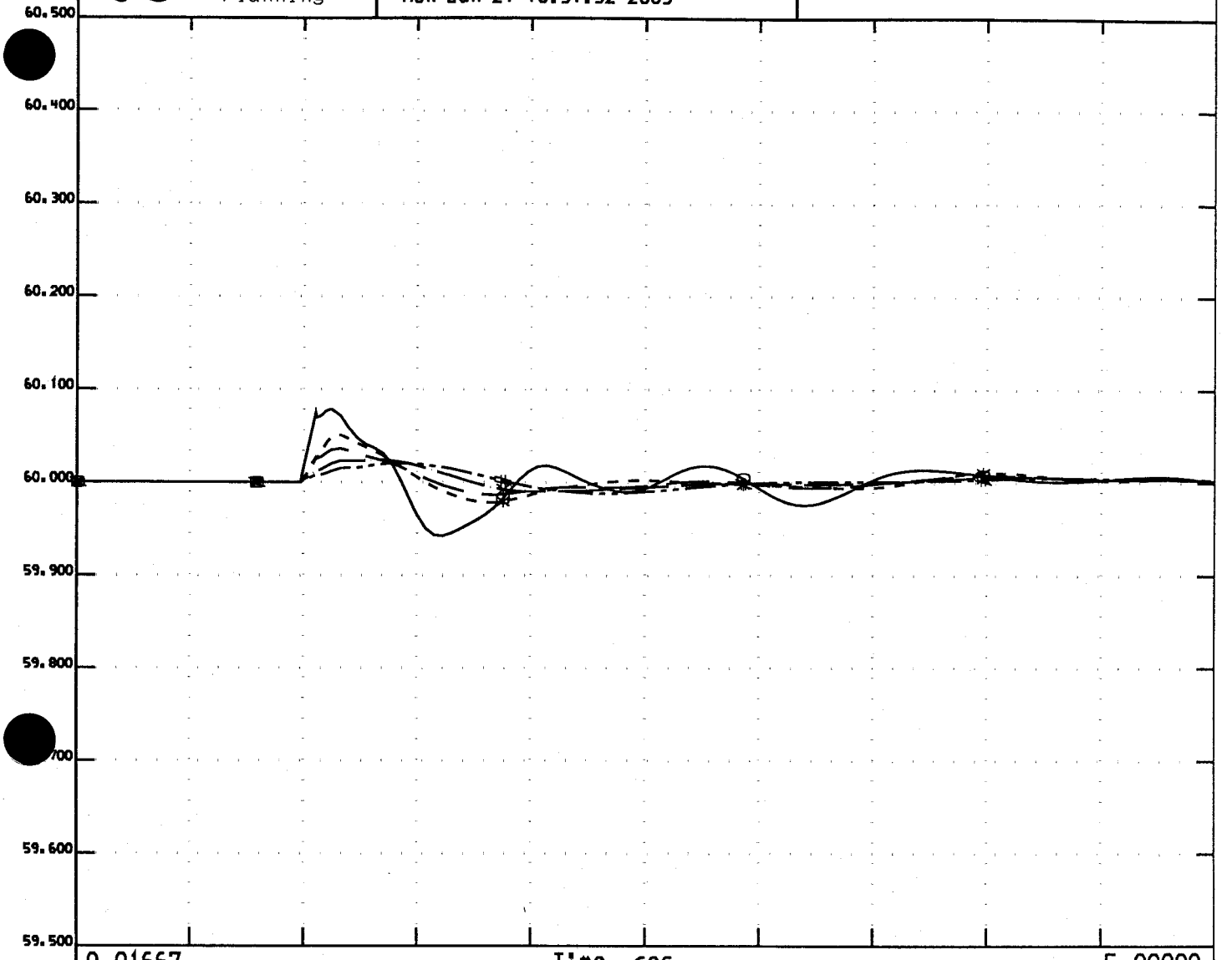
CHOLLA 500KV FLT CH-COR LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
CHO-COR STAB; 1/03; T=0 3P FLT CHO500;4C CLR FLT
W/CHO-COR;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

APS Transmission Planning

frequencies
Mon Jan 27 10:51:32 2003

10 year stability\2003\dist13.chf



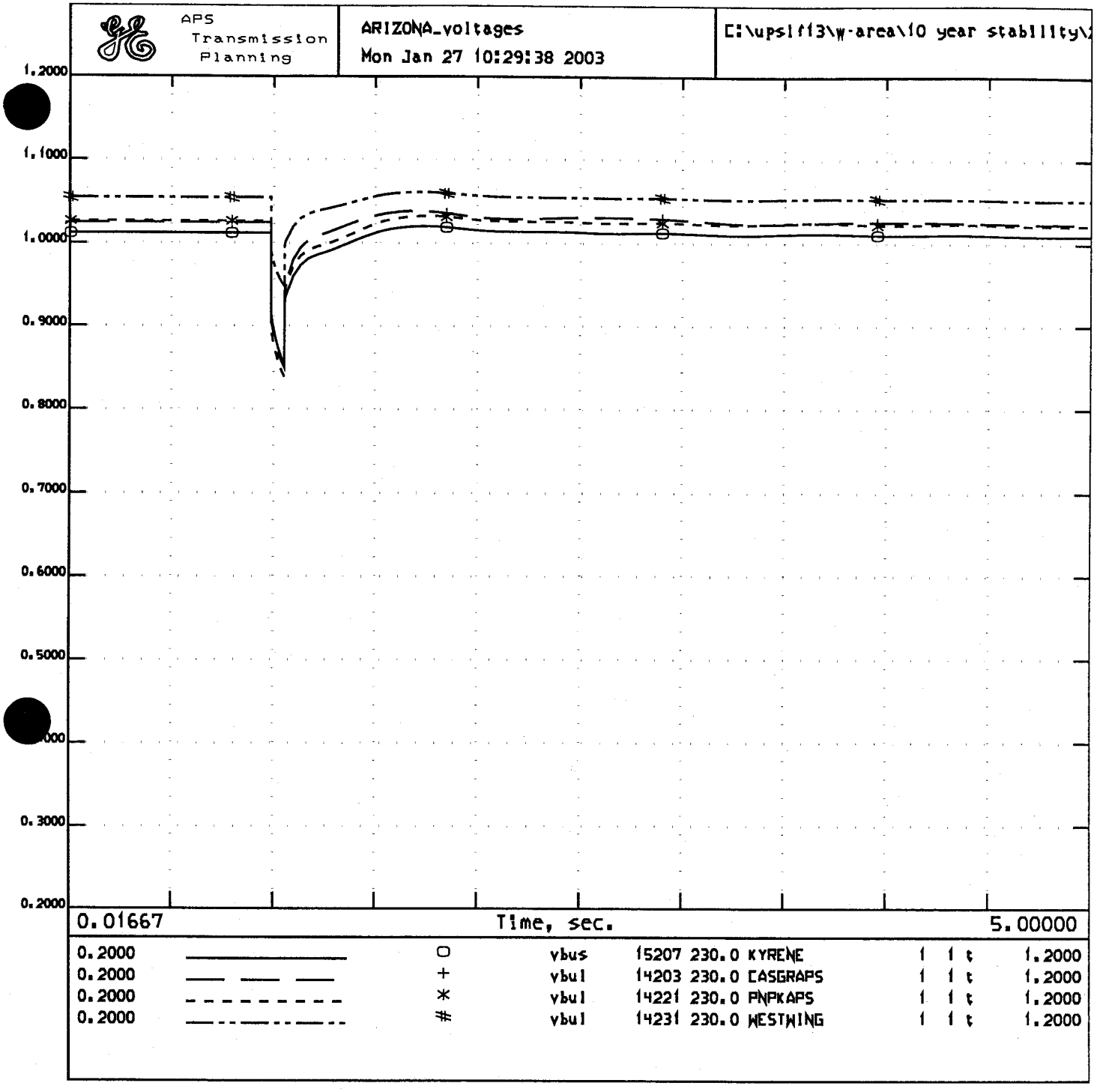
0.01667 Time, sec. 5.00000

59.500	————	○	fbus	14001	500.0	FOURCORN	1	1 u	60.500
59.500	— — —	+	fbus	14003	500.0	NAVAJO	1	1 u	60.500
59.500	- - - - - - - -	*	fbul	14231	230.0	WESTWING	1	1 u	60.500
59.500	—-—-—-—	#	fbus	26003	500.0	ADELANTO	1	1 u	60.500
59.500	—— —— ——	×	fbus	26048	500.0	MCCULLGH	1	1 u	60.500

CHOLLA 500KV FLT CH-COR LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
CHO-COR STAB; 1/03; T=0 3P FLT CH0500;4C CLR FLT
W/CHO-COR;2003.dyd;WSCC.bpt

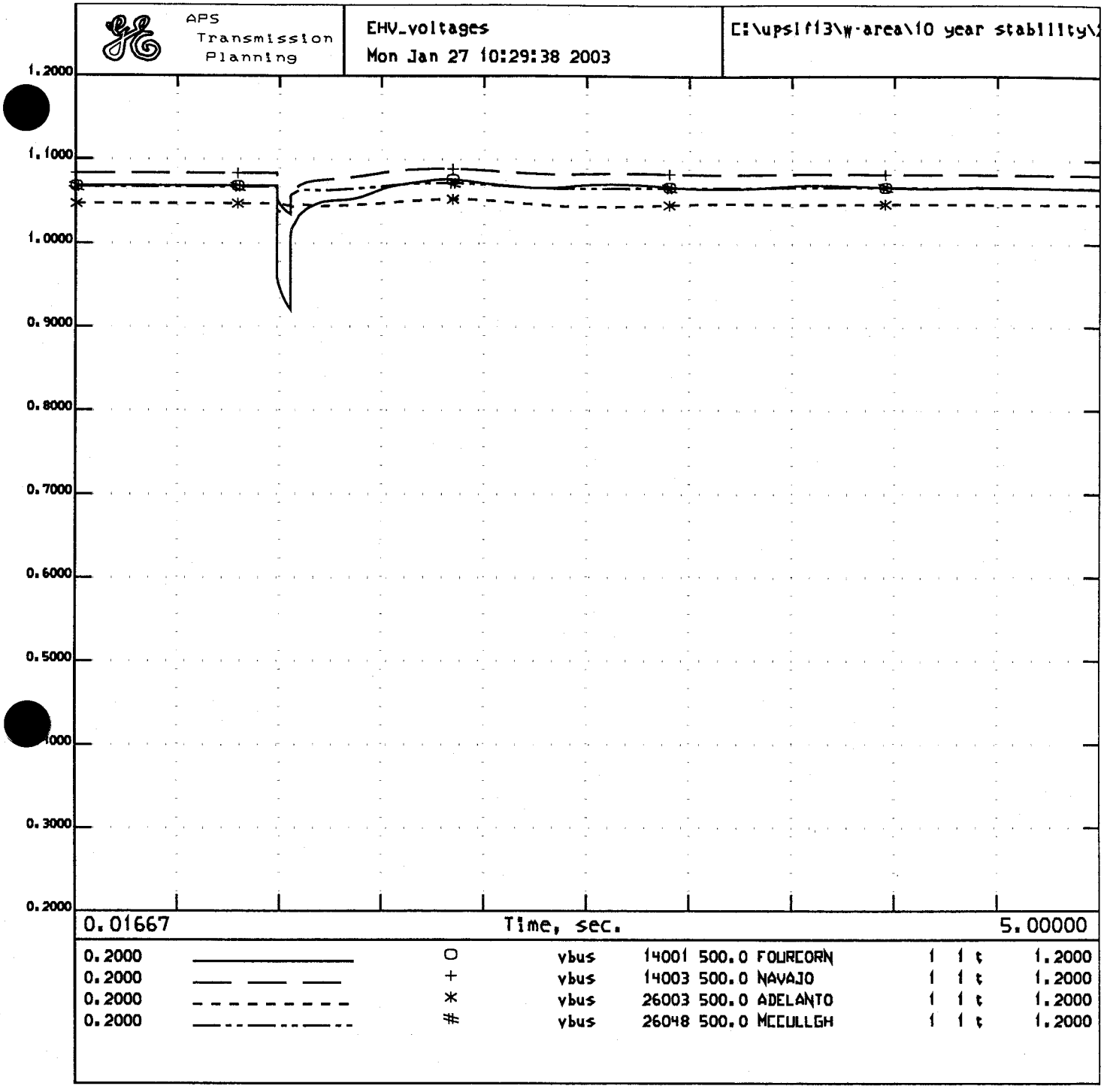
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

B15



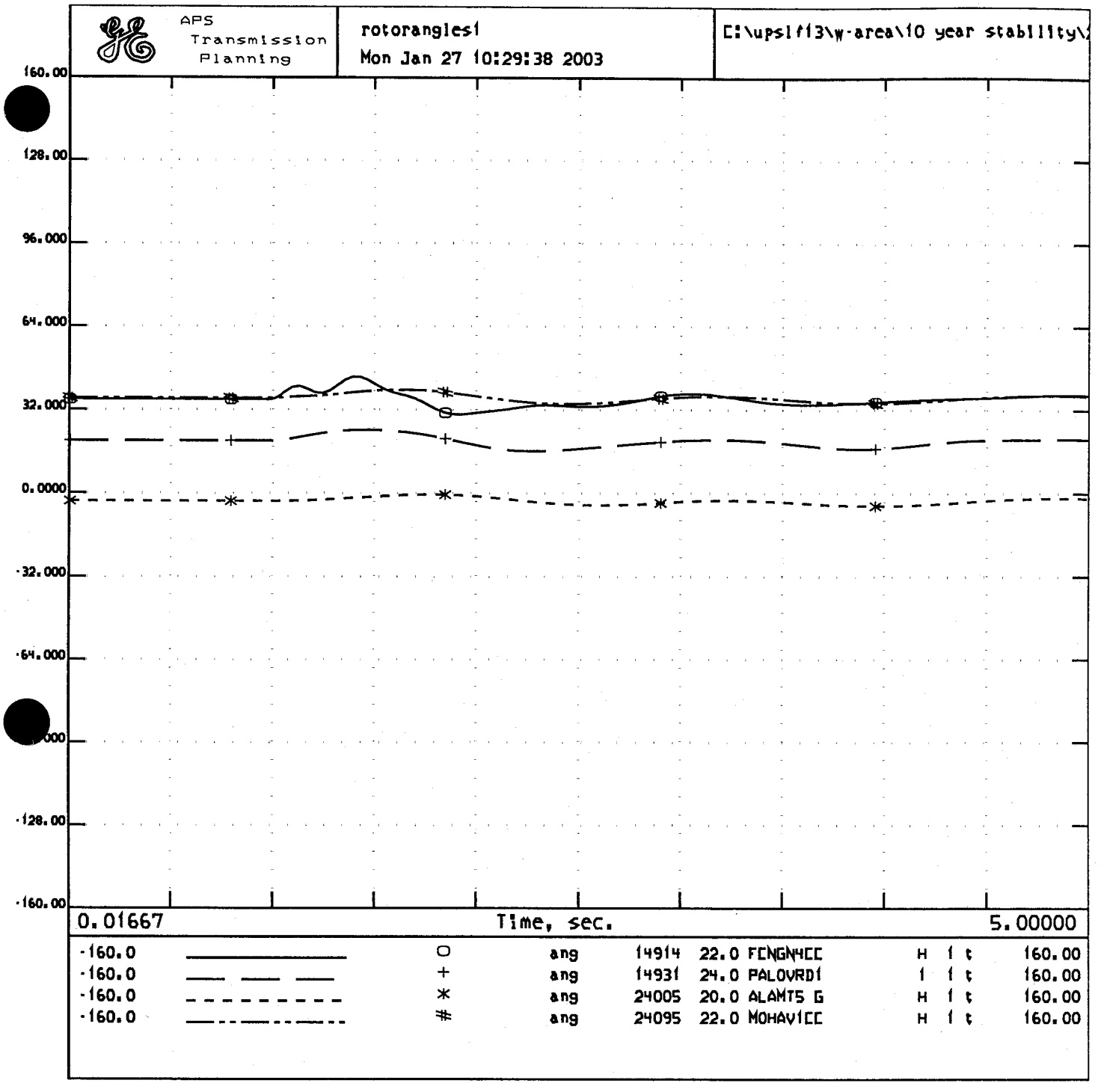
CHOLLA 500KV FLT CH-SAG LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
CHO-SAG STAB; 1/03; T=0 3P FLT CHO500;4C CLR FLT
W/CHO-SAG;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



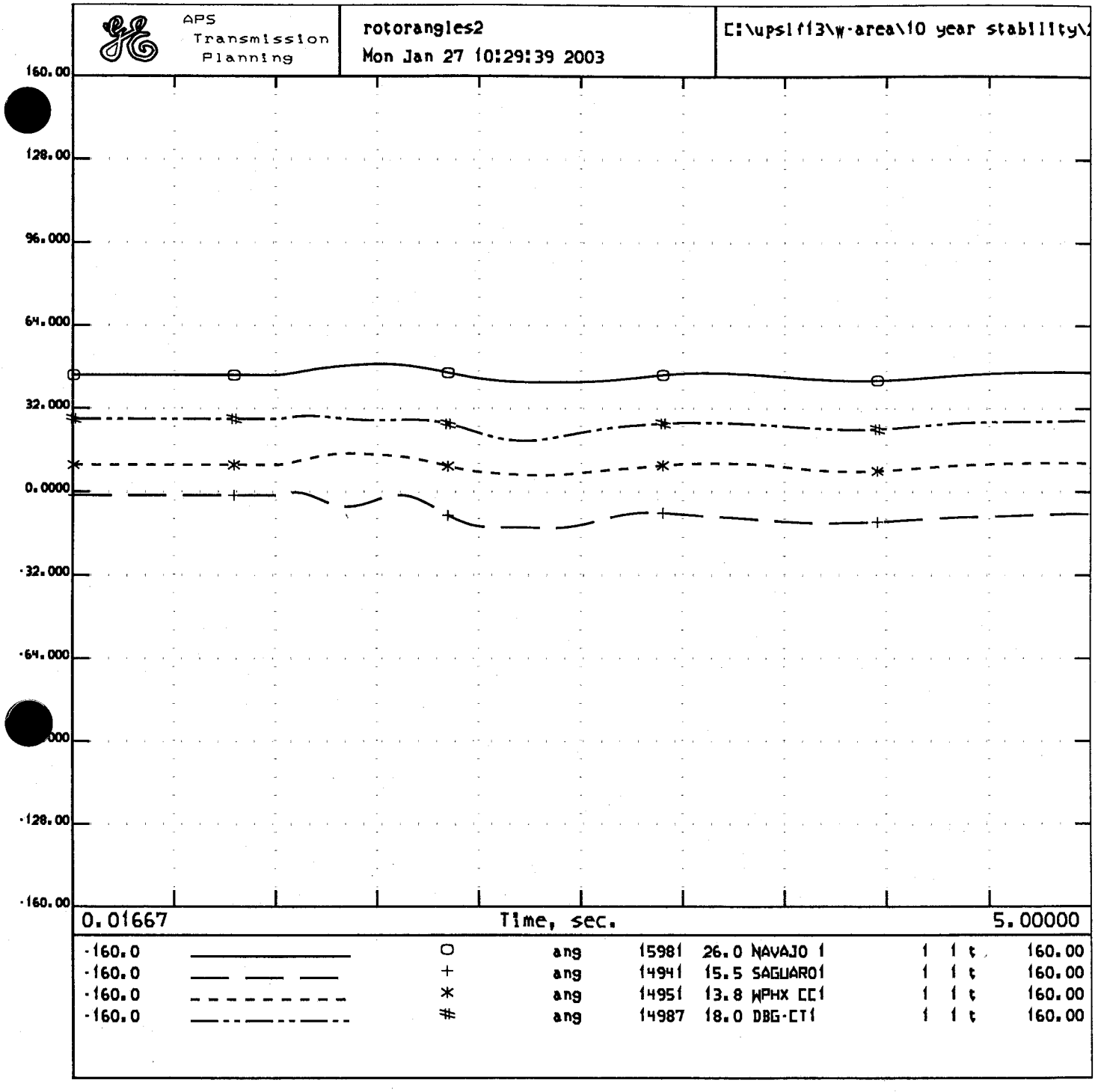
CHOLLA 500KV FLT CH-SAG LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
CHO-SAG STAB; 1/03; T=0 3P FLT CHO500;4C CLR FLT
W/CHO-SAG;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



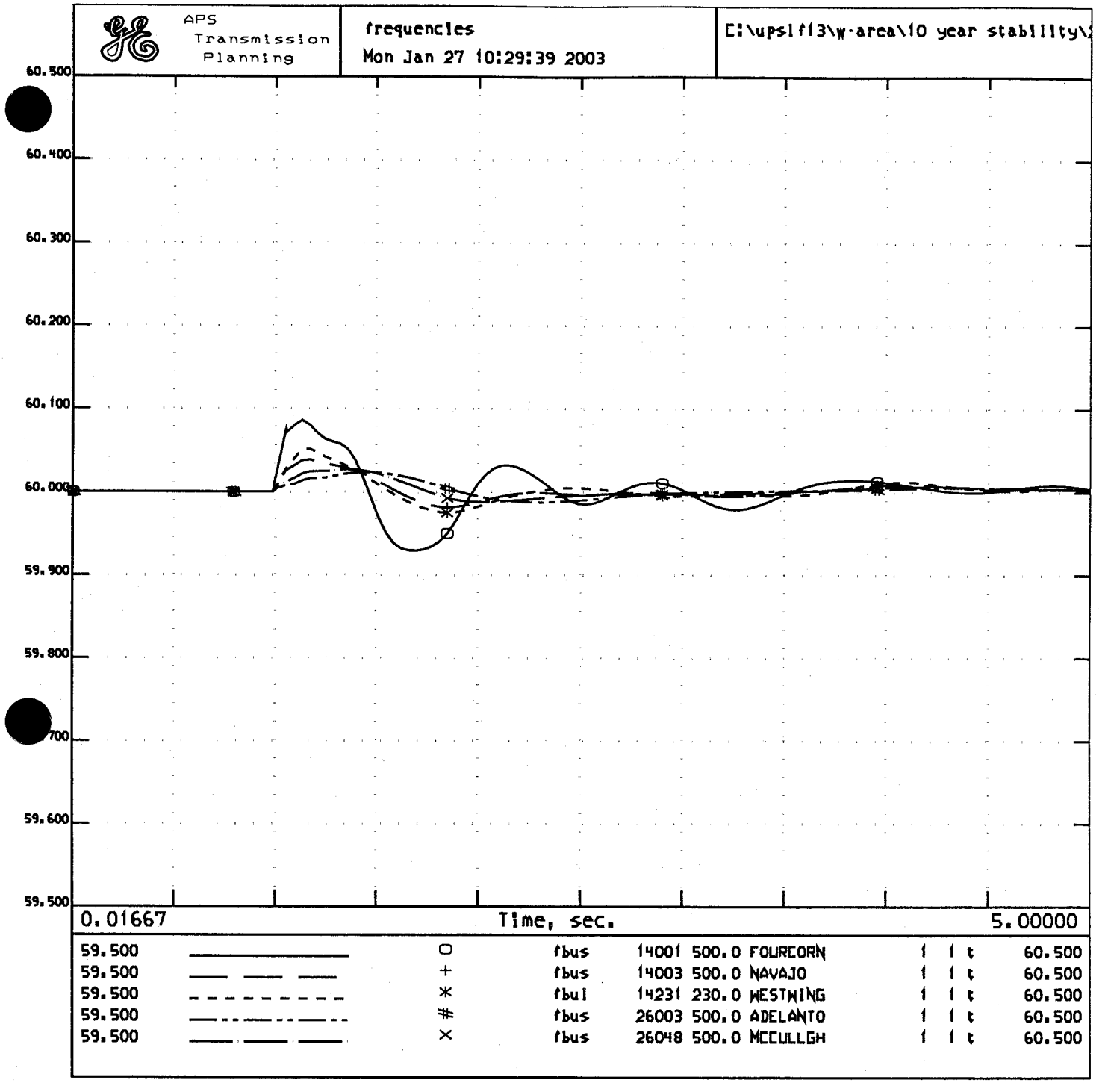
CHOLLA 500KV FLT CH-SAG LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
CHO-SAG STAB; 1/03; T=0 3P FLT CHO500;4C CLR FLT
W/CHO-SAG;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



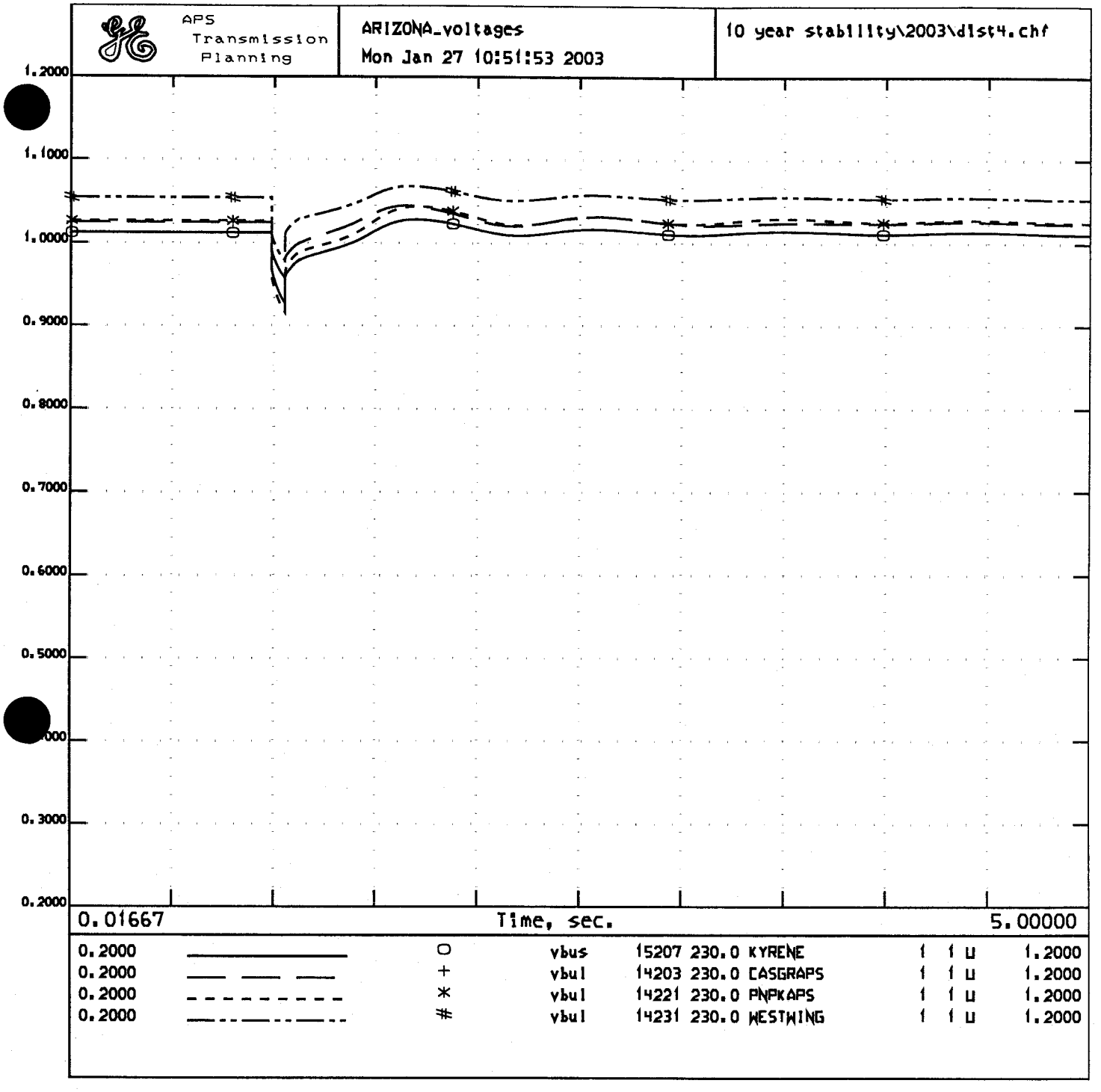
CHOLLA 500KV FLT CH-SAG LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
CHO-SAG STAB; 1/03; T=0 3P FLT CHO500;4C CLR FLT
W/CHO-SAG;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



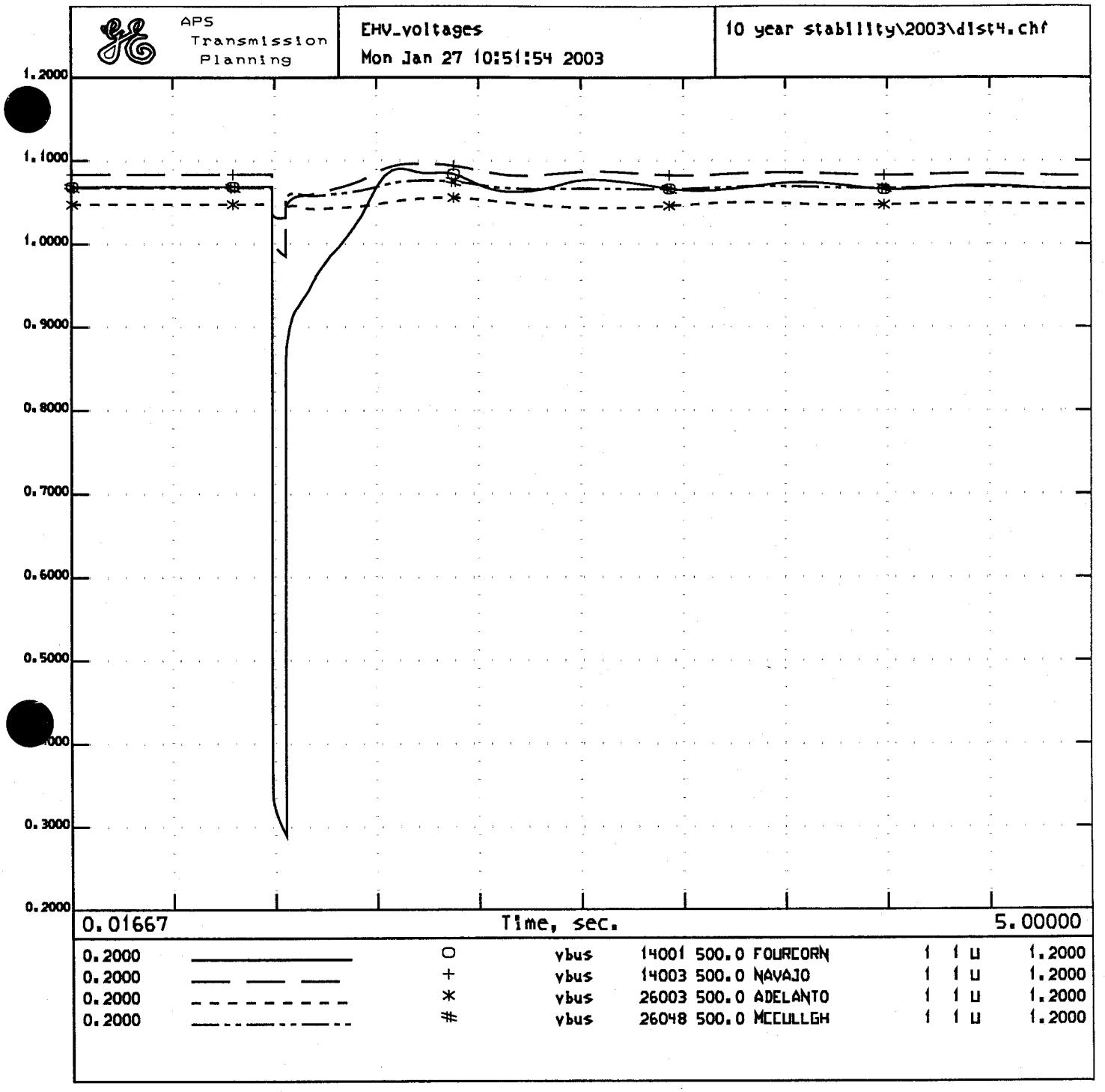
CHOLLA 500KV FLT CH-SAG LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
CHO-SAG STAB; 1/03; T=0 3P FLT CHO500;4C CLR FLT
W/CHO-SAG;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



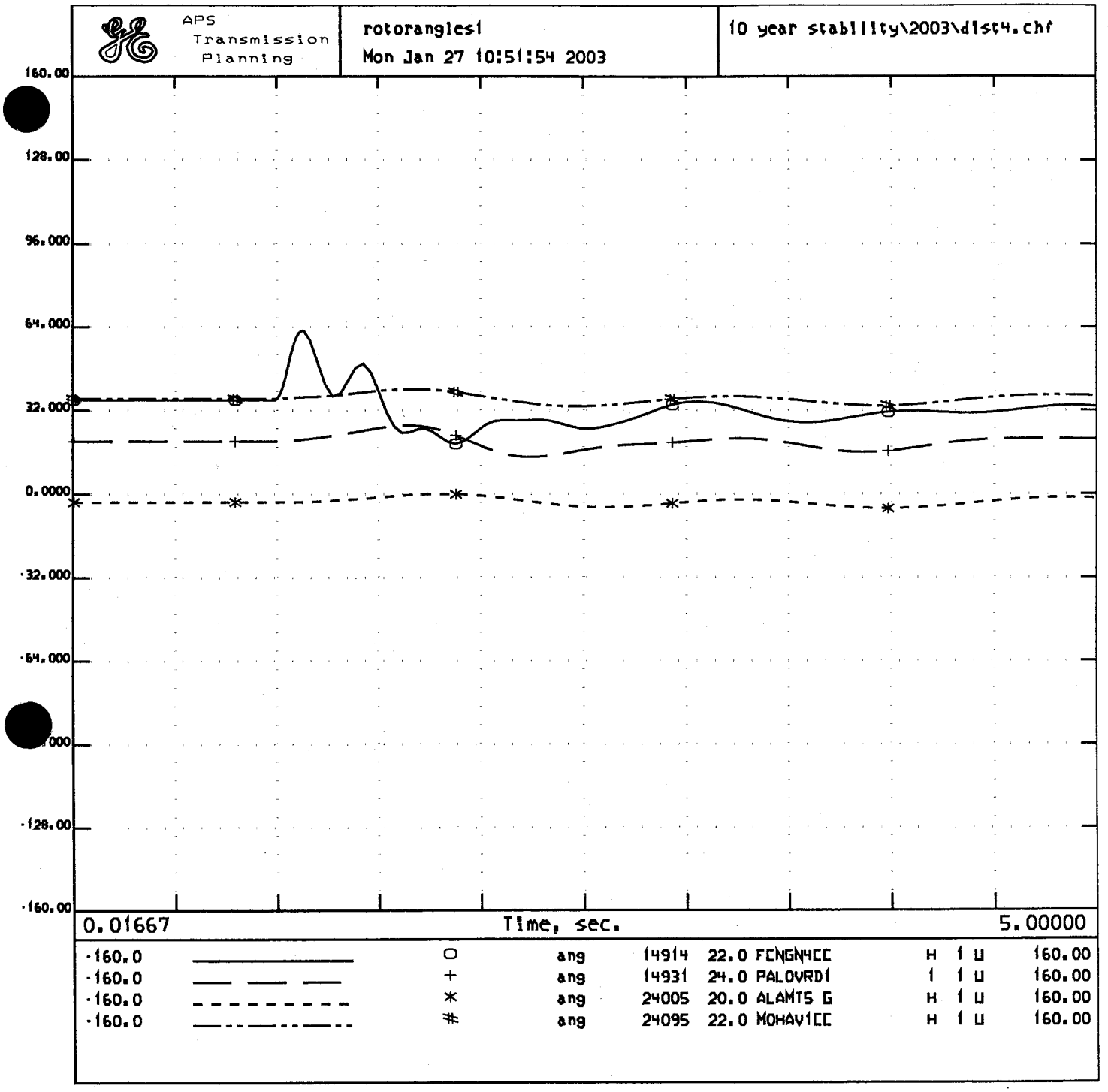
FCN345 fault with FCN-CHOLLA line out
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
FCN-CHO #1 STAB; 1/03; T=0 3P FLT FCN345;10% FLT DMPING;FLSH
CAPS FCN-CHO;4C CLR FLT W/FCN-CHO #1; 8C REIN CAPS;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



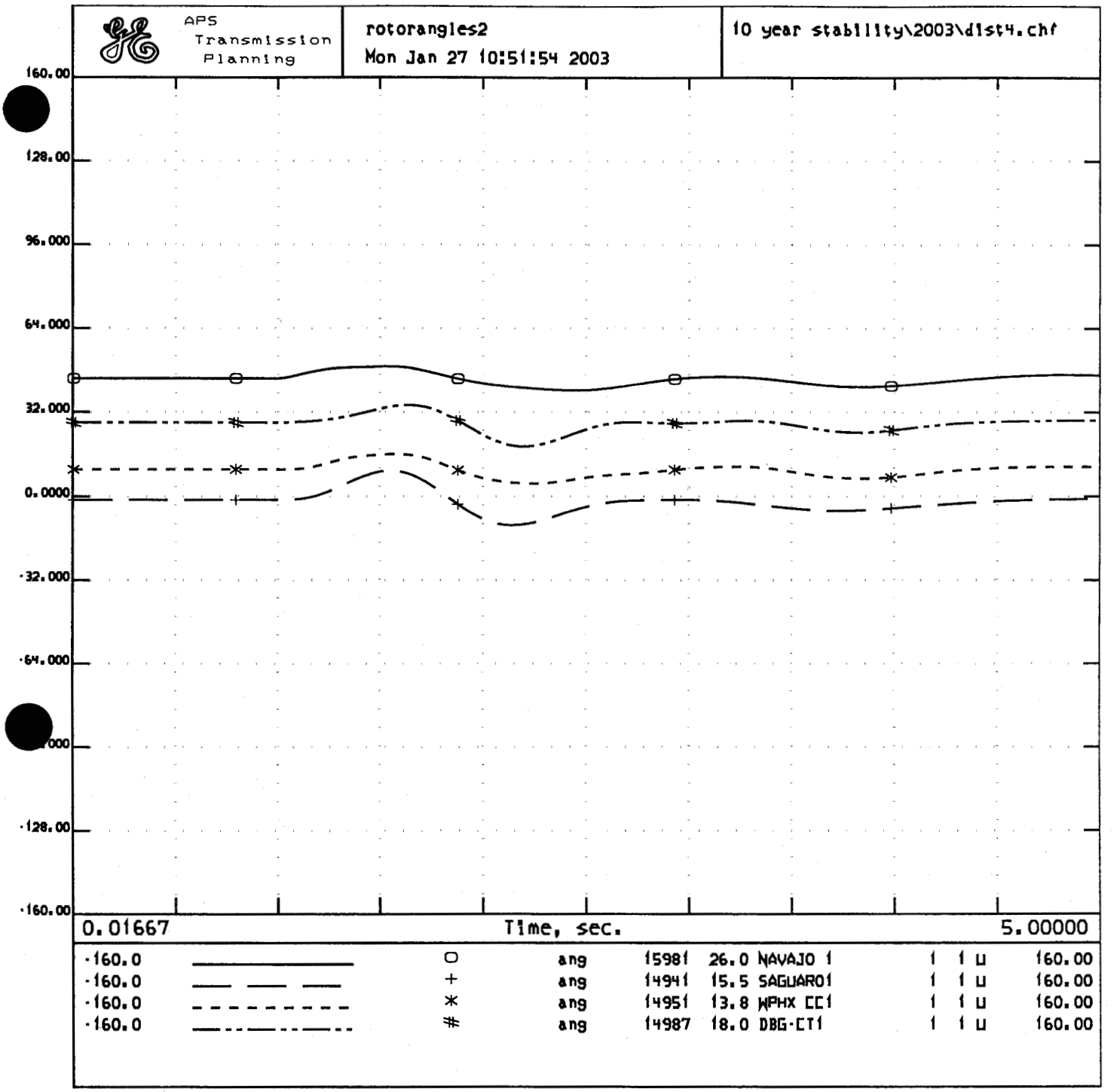
FCN345 fault with FCN-CHOLLA line out
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
FCN-CHO #1 STAB; 1/03; T=0 3P FLT FCN345;10% FLT DMPING;FLSH
CAPS FCN-CHO;4C CLR FLT W/FCN-CHO #1; 8C REIN CAPS;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



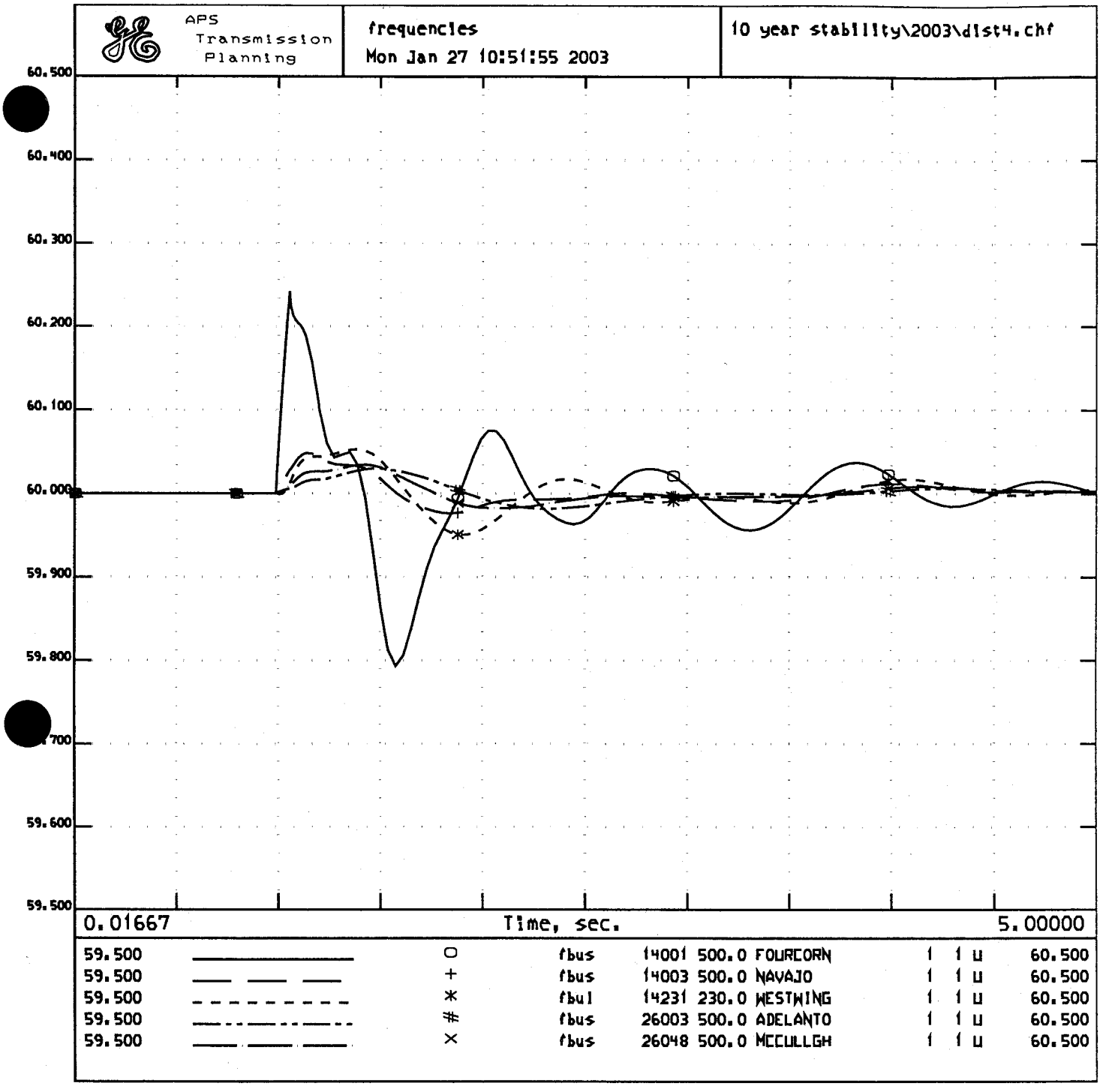
FCN345 fault with FCN-CHOLLA line out
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
FCN-CHO #1 STAB; 1/03; T=0 3P FLT FCN345;10% FLT DMPING;FLSH
CAPS FCN-CHO;4C CLR FLT W/FCN-CHO #1; 8C REIN CAPS;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



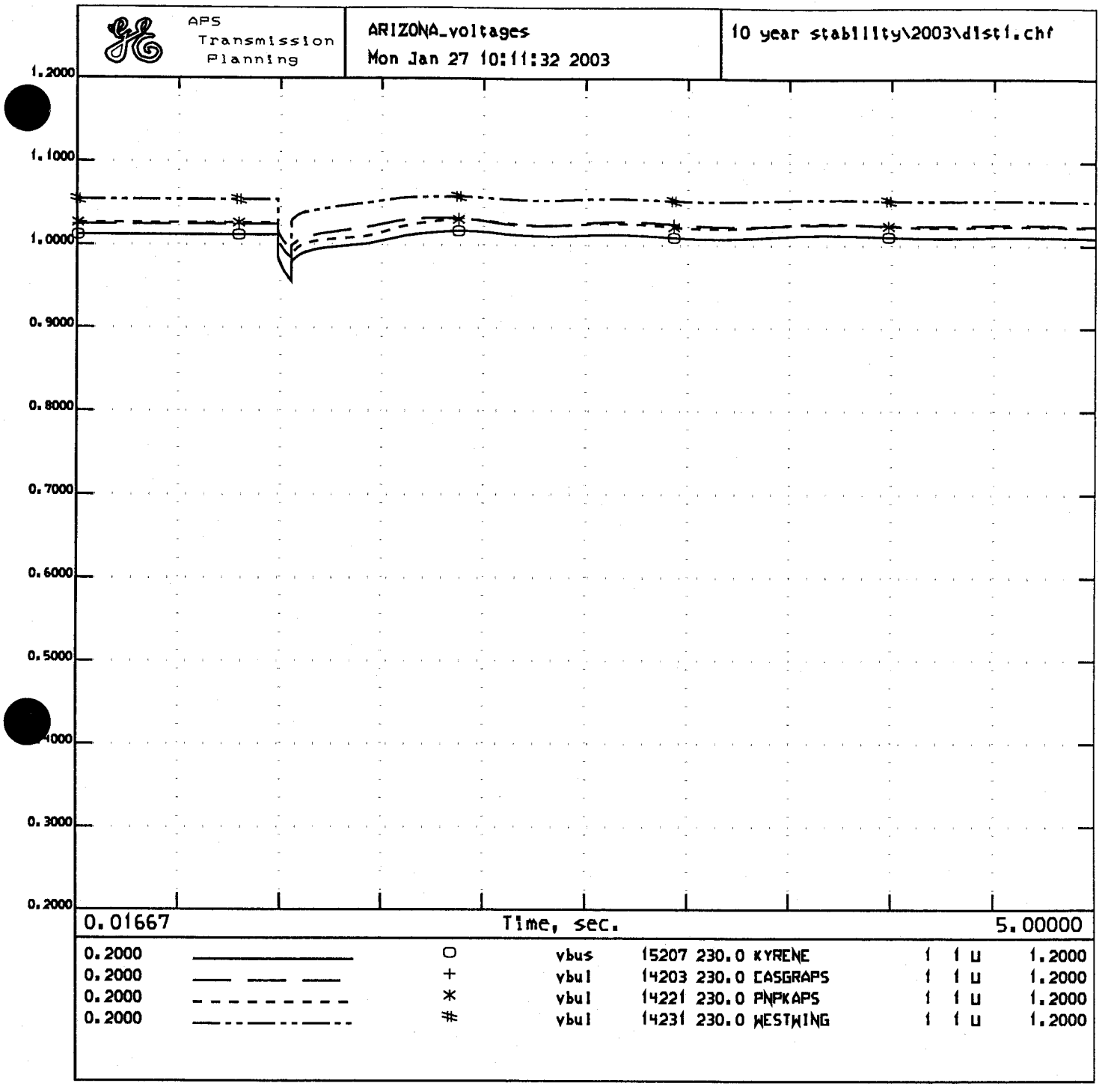
FCN345 fault with FCN-CHOLLA line out
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
FCN-CHO #1 STAB; 1/03; T=0 3P FLT FCN345;10% FLT DMPING;FLSH
CAPS FCN-CHO;4C CLR FLT W/FCN-CHO #1; 8C REIN CAPS;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



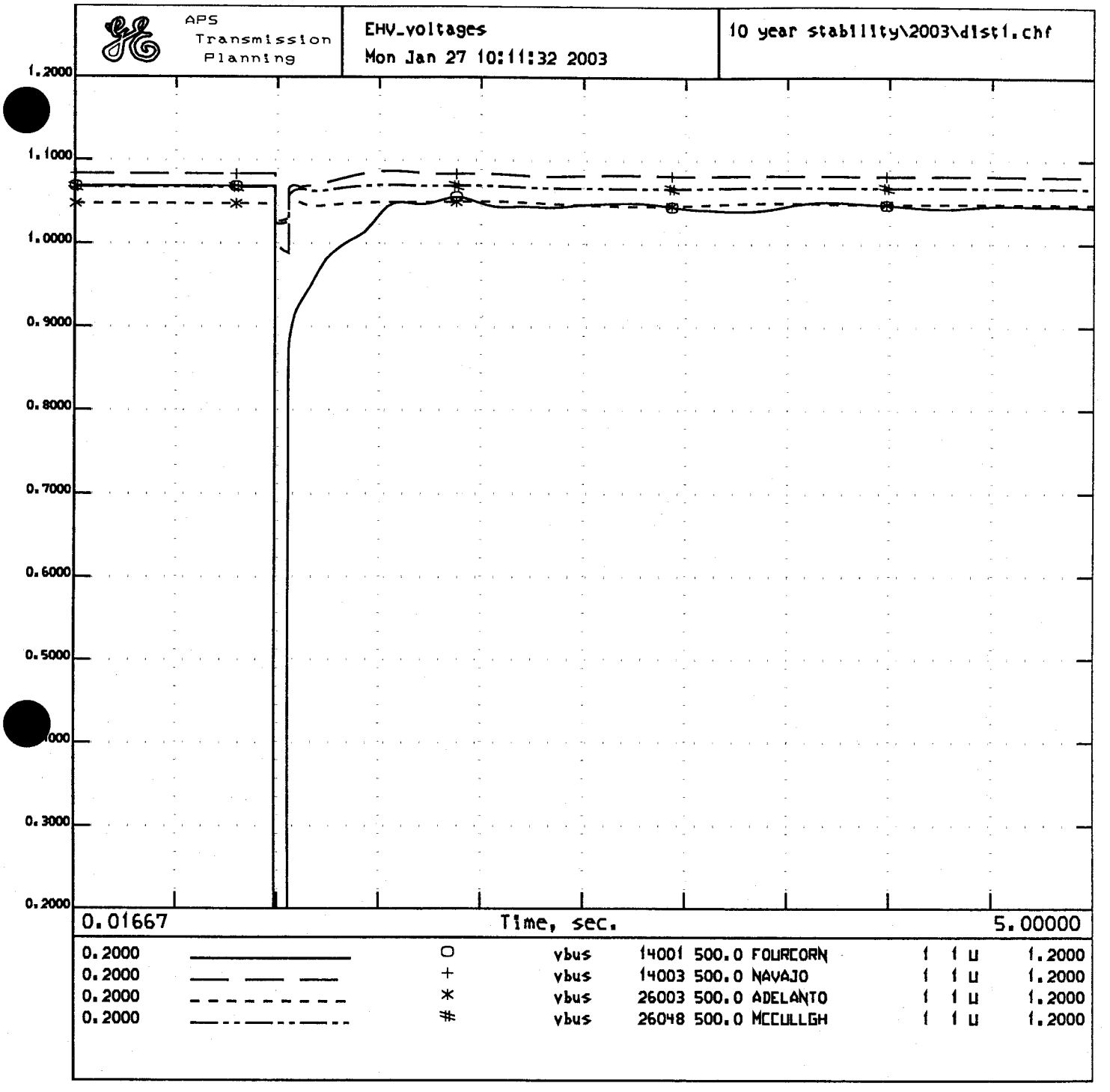
FCN345 fault with FCN-CHOLLA line out
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
FCN-CHO =1 STAB; 1/03; T=0 3P FLT FCN345;10% FLT DMPING;FLSH
CAPS FCN-CHO;4C CLR FLT W/FCN-CHO =1; 8C REIN CAPS;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



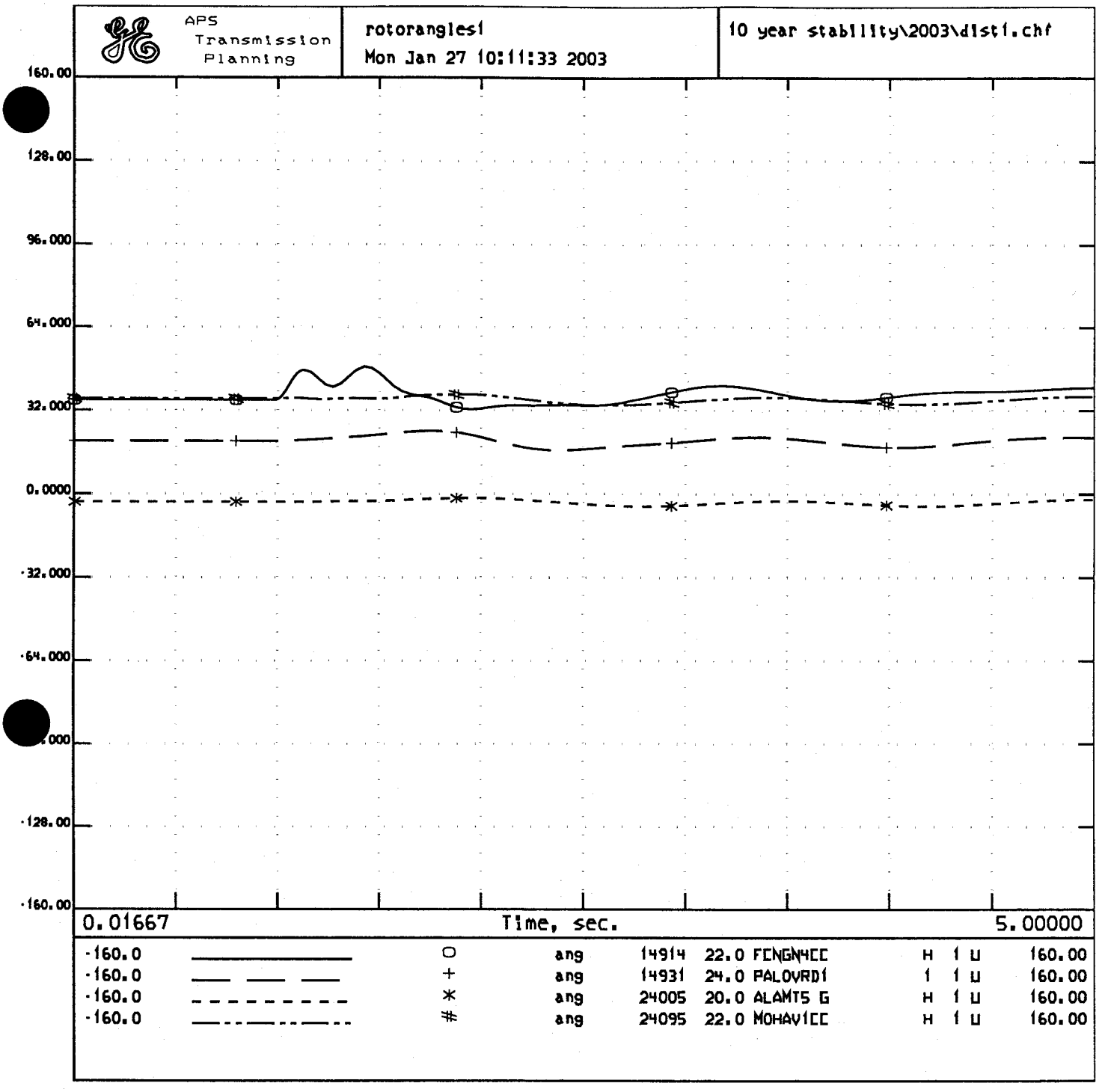
FCN FLT500 FCN-MNK out
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
FOURCORN-MOENKOPI STAB; 1/03; T=0 3P FLT FCN500;10% FLT DMPING;FLSH
CAPS FCN-MKP/NAV-MKP;4C CLR FLT W/FCN-MKP;8C REIN CAPS;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



FCN FLT500 FCN-MNK out
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
FOURCORN-MOENKOPI STAB; 1/03; T=0 3P FLT FCN500;10% FLT DMPING;FLSH
CAPS FCN-MKP/NAV-MKP;4C CLR FLT W/FCN-MKP;8C REIN CAPS;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



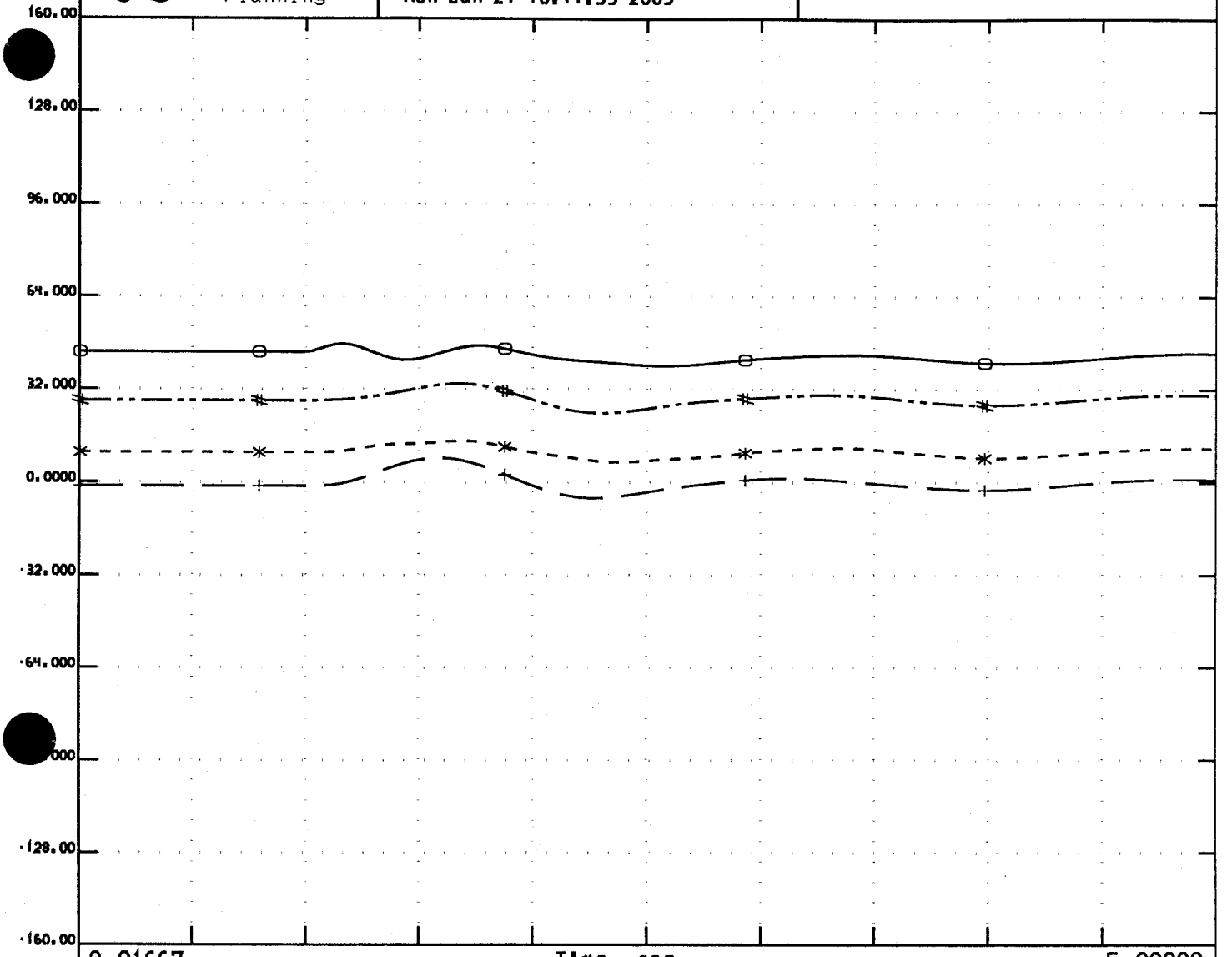
FCN FLT500 FCN-MNK out
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
FOURCORN-MOENKOPI STAB; 1/03; T=0 3P FLT FCN500;10% FLT DMPING;FLSH
CAPS FCN-MKP/NAV-MKP;4C CLR FLT W/FCN-MKP;8C REIN CAPS;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

APS Transmission Planning

rotorangles2
Mon Jan 27 10:11:33 2003

10 year stability\2003\dist1.chf



0.01667 Time, sec. 5.00000

-160.0	————	o	ang	15981	26.0 NAVAJO 1	1	1	u	160.00
-160.0	— — —	+	ang	14941	15.5 SAGUARO1	1	1	u	160.00
-160.0	- - - - - -	*	ang	14951	13.8 WPHX CC1	1	1	u	160.00
-160.0	—-—-—	#	ang	14987	18.0 DBG-CT1	1	1	u	160.00

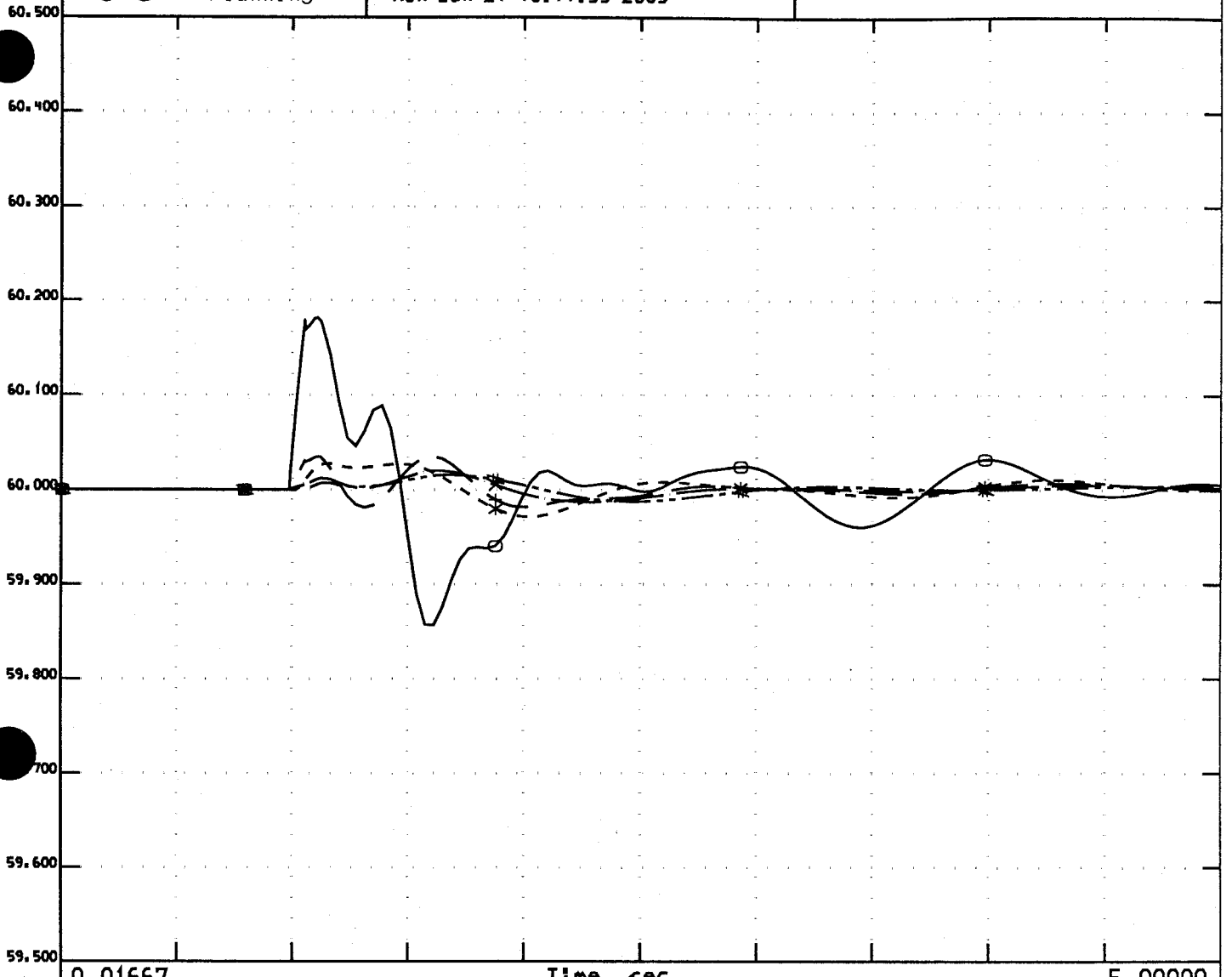
FCN FLT500 FCN-MNK out
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
FOURCORN-MOENKOPI STAB; 1/03; T=0 3P FLT FCN500;10% FLT DMPING;FLSH
CAPS FCN-MKP/NAV-MKP;4C CLR FLT W/FCN-MKP;8C REIN CAPS;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

APS Transmission Planning

frequencies
Mon Jan 27 10:11:33 2003

10 year stability\2003\dist1.chf

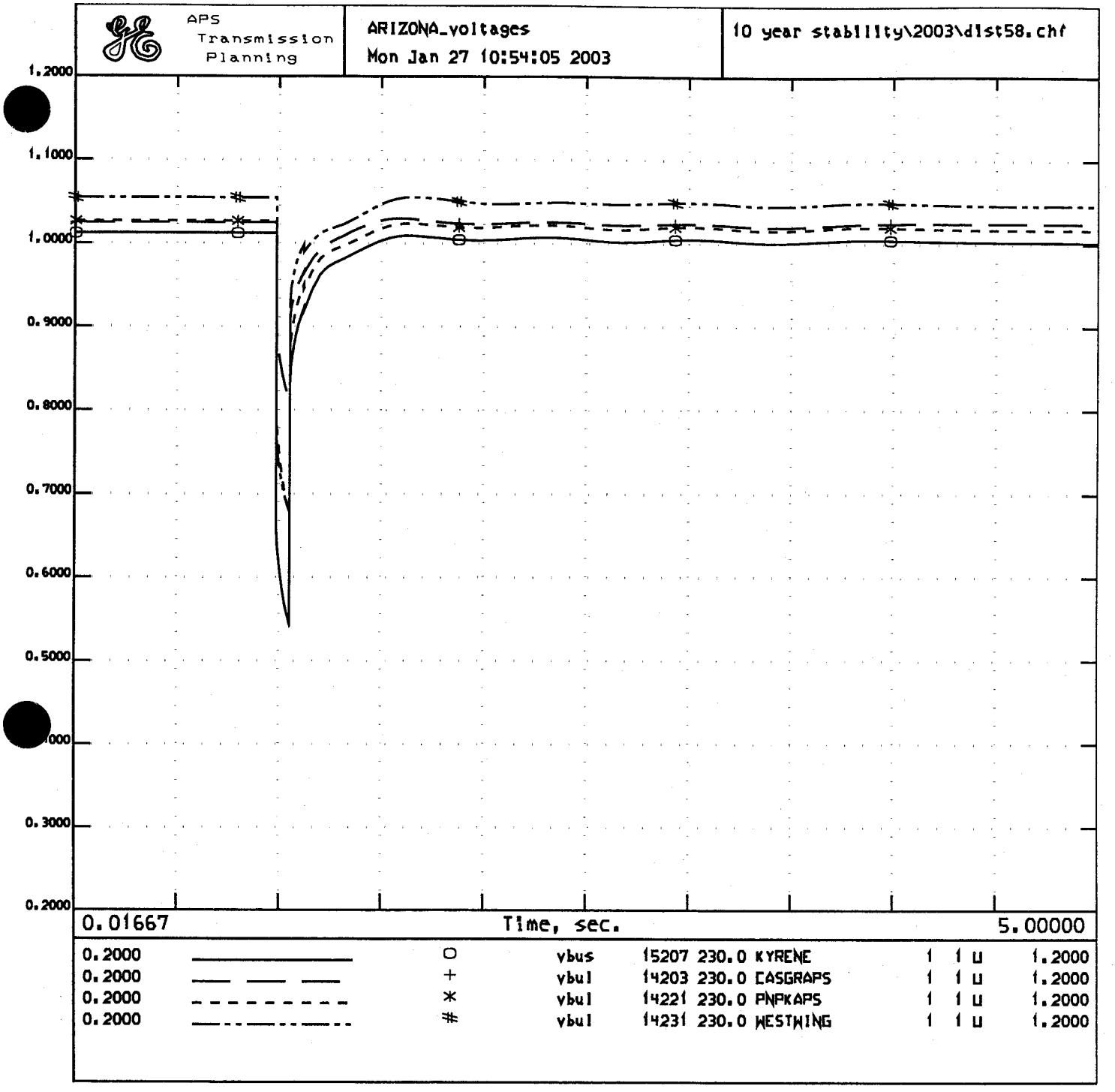


59.500	————————	O	fbus	14001	500.0	FOURCORN	1	1 u	60.500
59.500	—— —— ——	+	fbus	14003	500.0	NAVAJO	1	1 u	60.500
59.500	- - - - - - - - - -	*	fbul	14231	230.0	WESTWING	1	1 u	60.500
59.500	—— - - —— - - —— - -	#	fbus	26003	500.0	ADELANTO	1	1 u	60.500
59.500	—— . —— . —— .	×	fbus	26048	500.0	MCCULLGH	1	1 u	60.500

FCN FLT500 FCN-MNK out
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
FOURCORN-MOENKOPI STAB; 1/03; T=0 3P FLT FCN500;10% FLT DMPING;FLSH
CAPS FCN-MKP/NAV-MKP;4C CLR FLT W/FCN-MKP;8C REIN CAPS;2003.dyd;WSCC.bpt

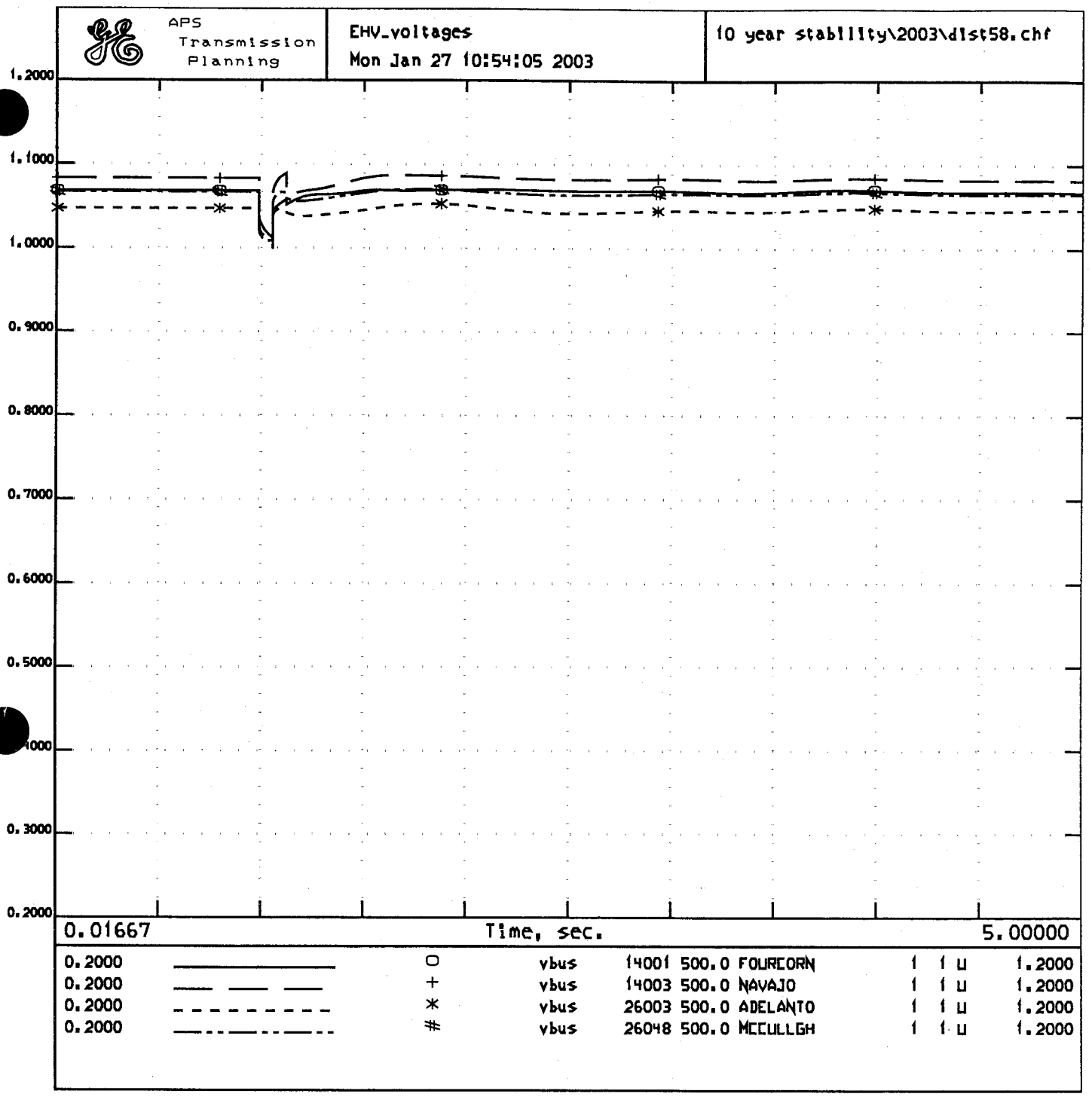
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

B30



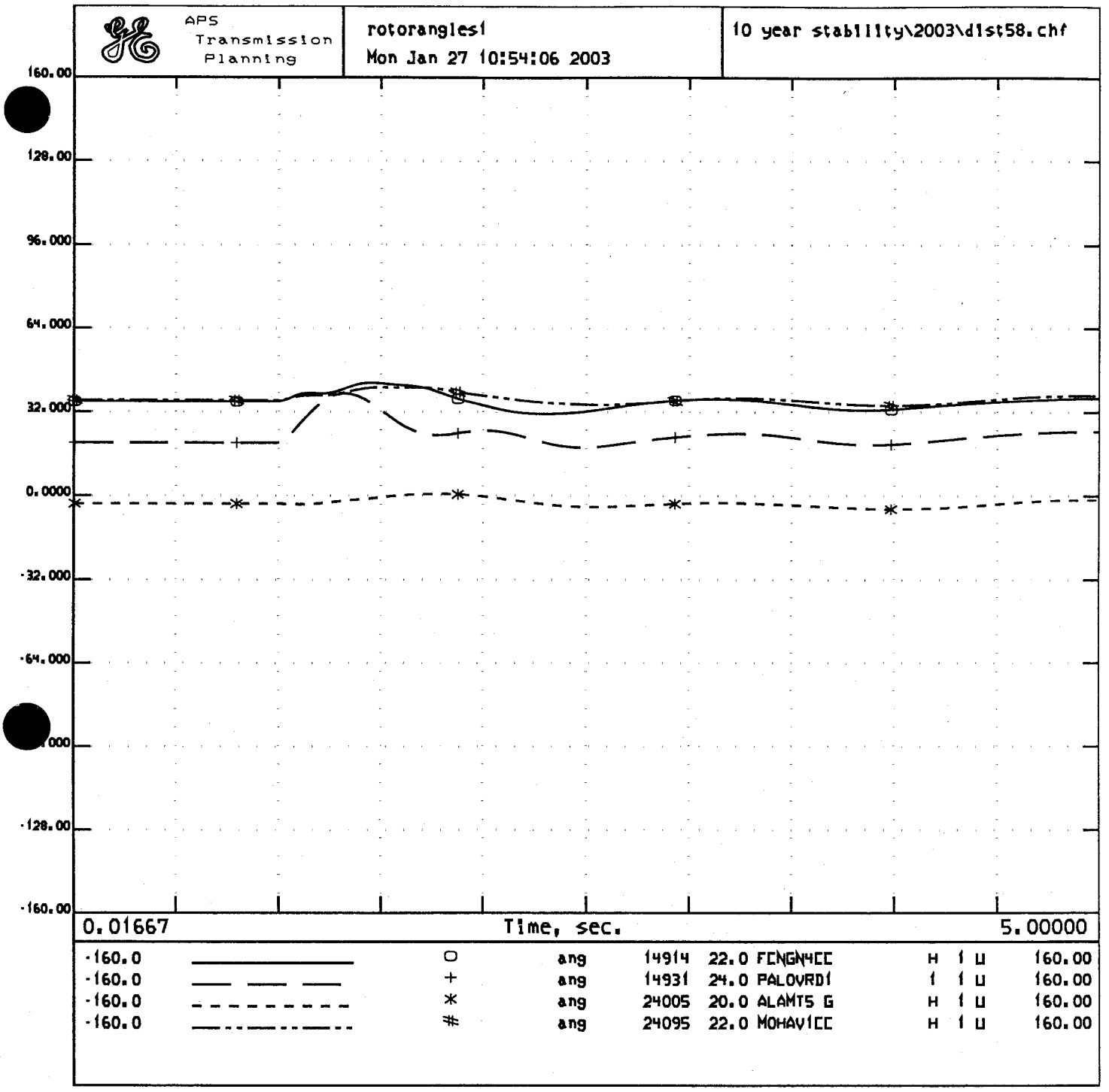
JOJOBA FLT HASSY-JOJOBA LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
HAS-JJ STAB #1; 01/03; T=0 3P FLT JJ500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/HAS-JJ;8C REIN;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



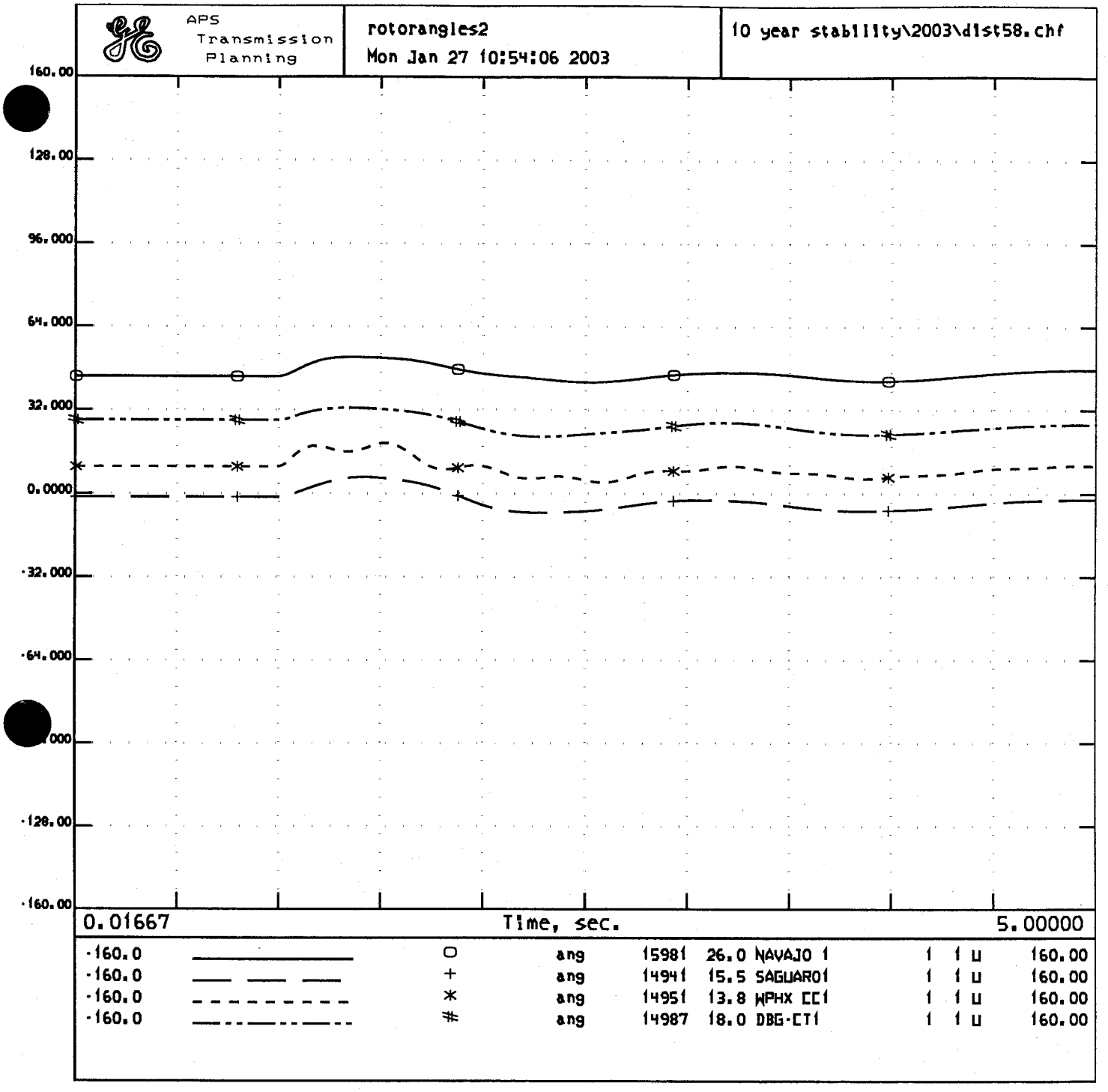
JOJOBA FLT HASSY-JOJOBA LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
HAS-JJ STAB •1; 01/03; T=0 3P FLT JJ500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/HAS-JJ;8C REIN;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



JOJOBA FLT HASSY-JOJOBA LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
HAS-JJ STAB .1; 01/03; T=0 3P FLT JJ500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/HAS-JJ;8C REIN;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



JOJOBA FLT HASSY-JOJOBA LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
HAS-JJ STAB #1; 01/03; T=0 3P FLT JJ500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/HAS-JJ;8C REIN;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

B34

APS Transmission Planning

frequencies
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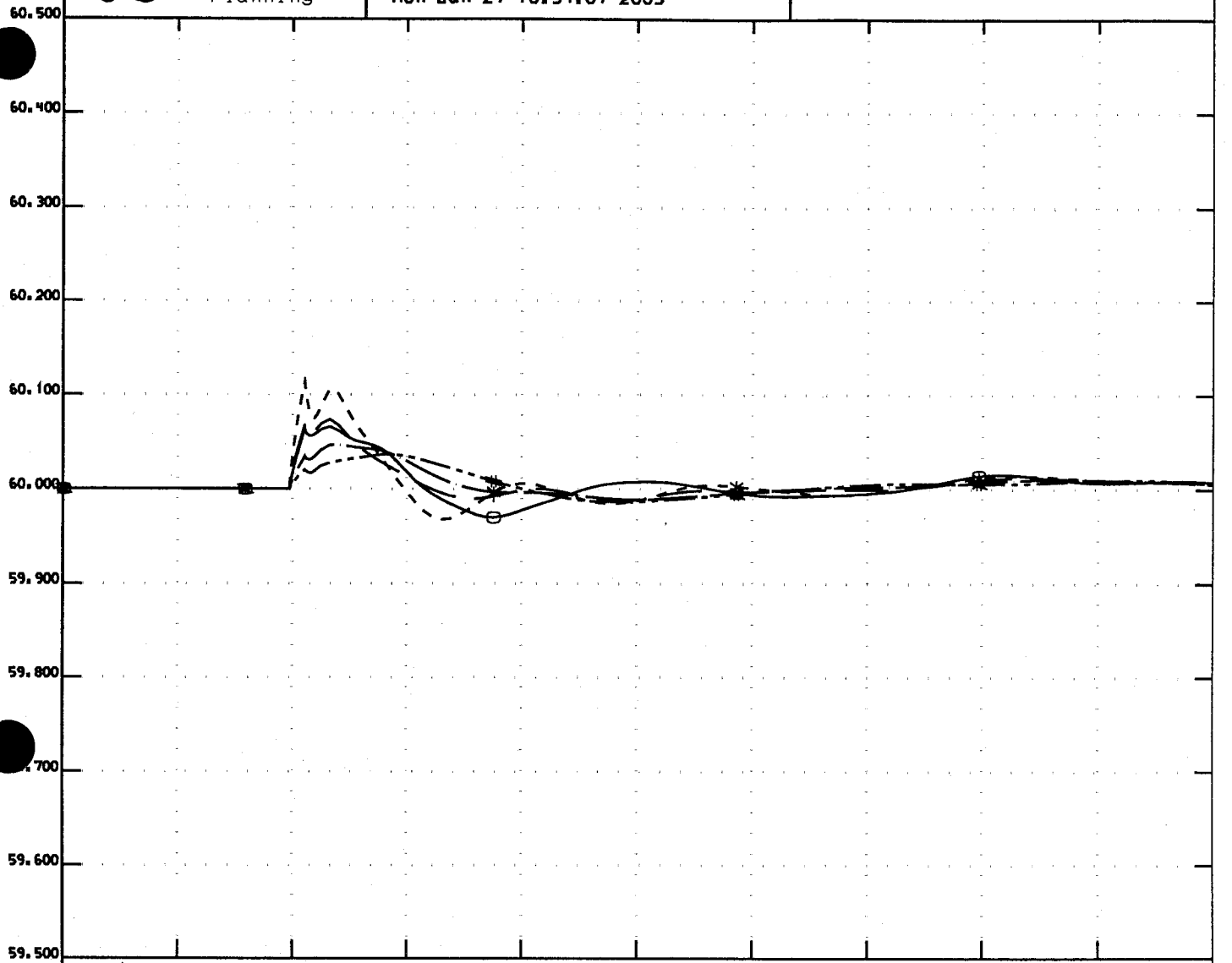
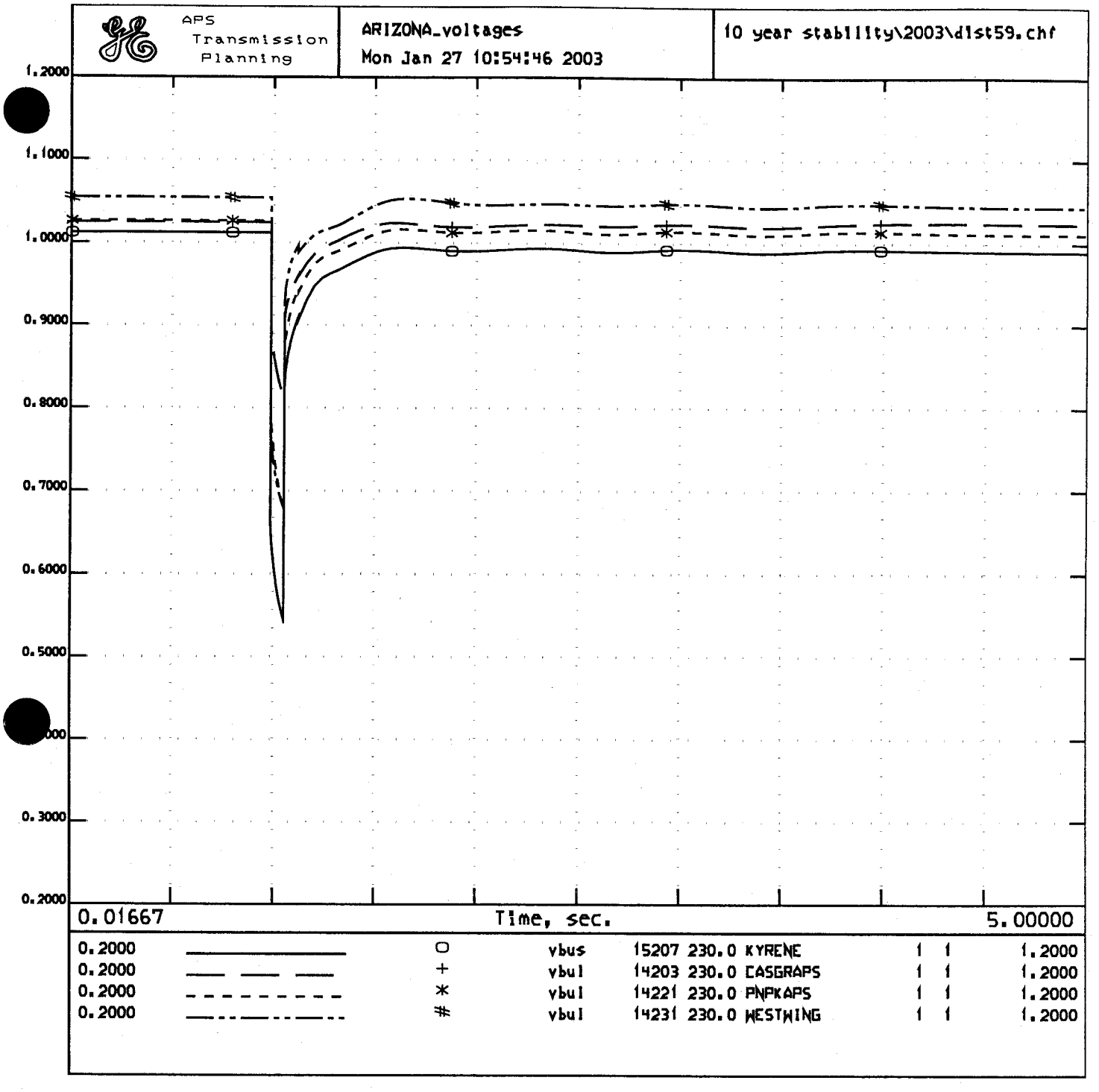
10 year stability\2003\dist58.chf



59.500	———	O	fbus	14001	500.0	FOURCORN	1	1 u	60.500
59.500	— — —	+	fbus	14003	500.0	NAVAJO	1	1 u	60.500
59.500	- - - - - -	*	fbul	14231	230.0	WESTWING	1	1 u	60.500
59.500	—-—-—	#	fbus	26003	500.0	ADELANTO	1	1 u	60.500
59.500	— — —	X	fbus	26048	500.0	MCCULLGH	1	1 u	60.500

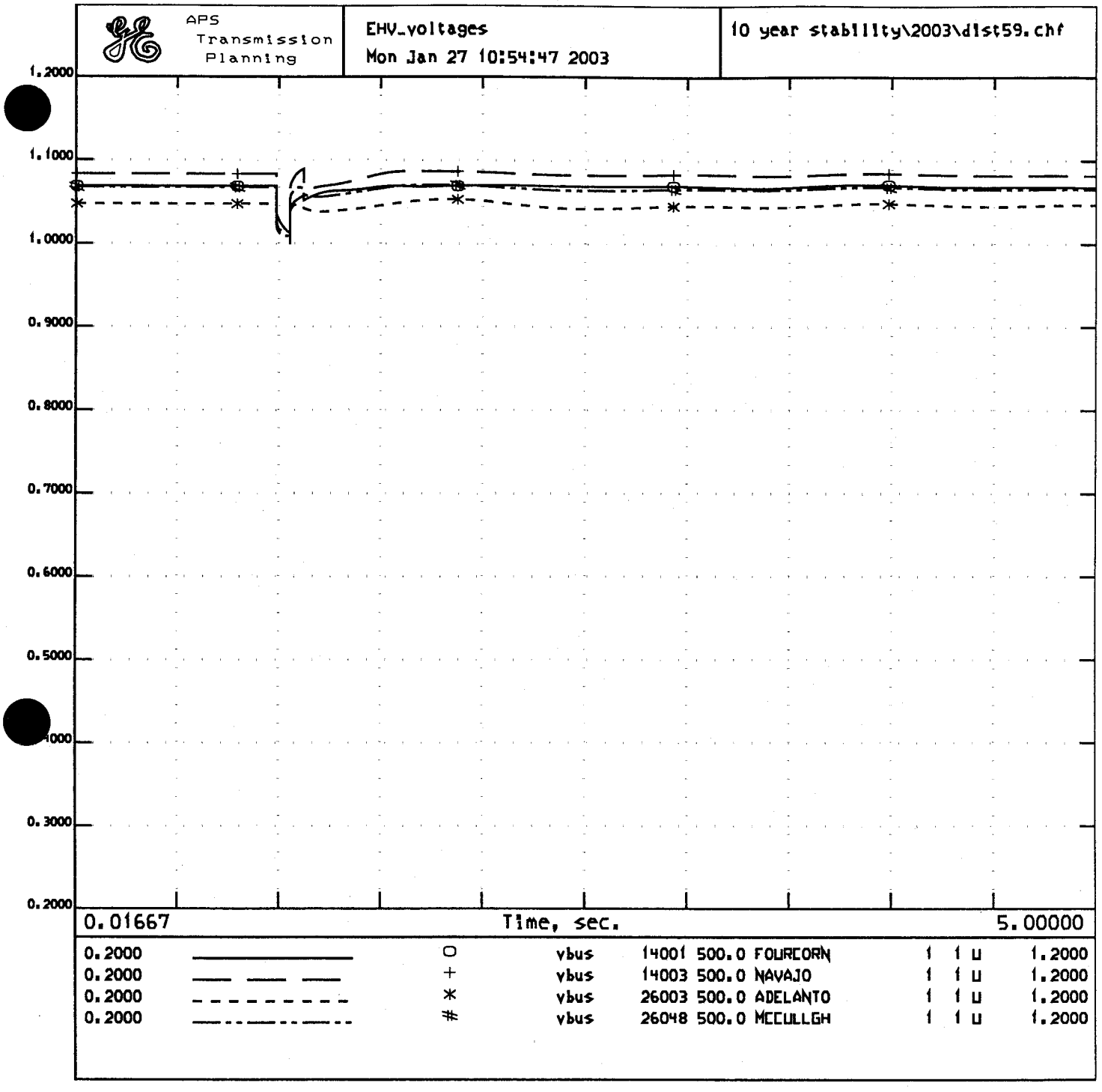
JOJOBA FLT HASSY-JOJOBA LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
HAS-JJ STAB *1; 01/03; T=0 3P FLT JJ500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/HAS-JJ;8C REIN;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



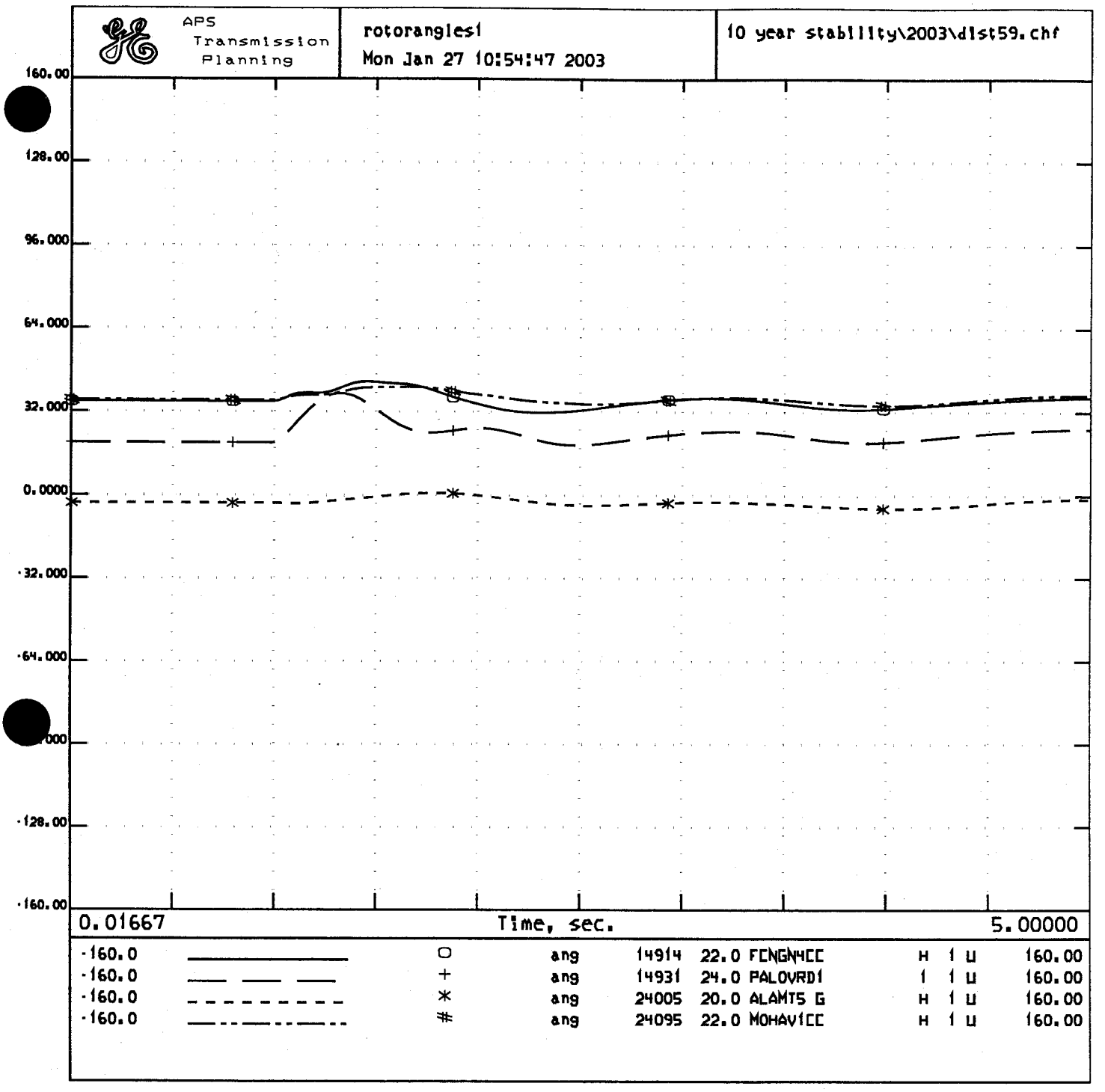
JOJOBA FLT JOJOBA-KYR LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
JJ-KYR STAB #1; 01/03; T=0 3P FLT JJ500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/JJ-KYR;8C REIN;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



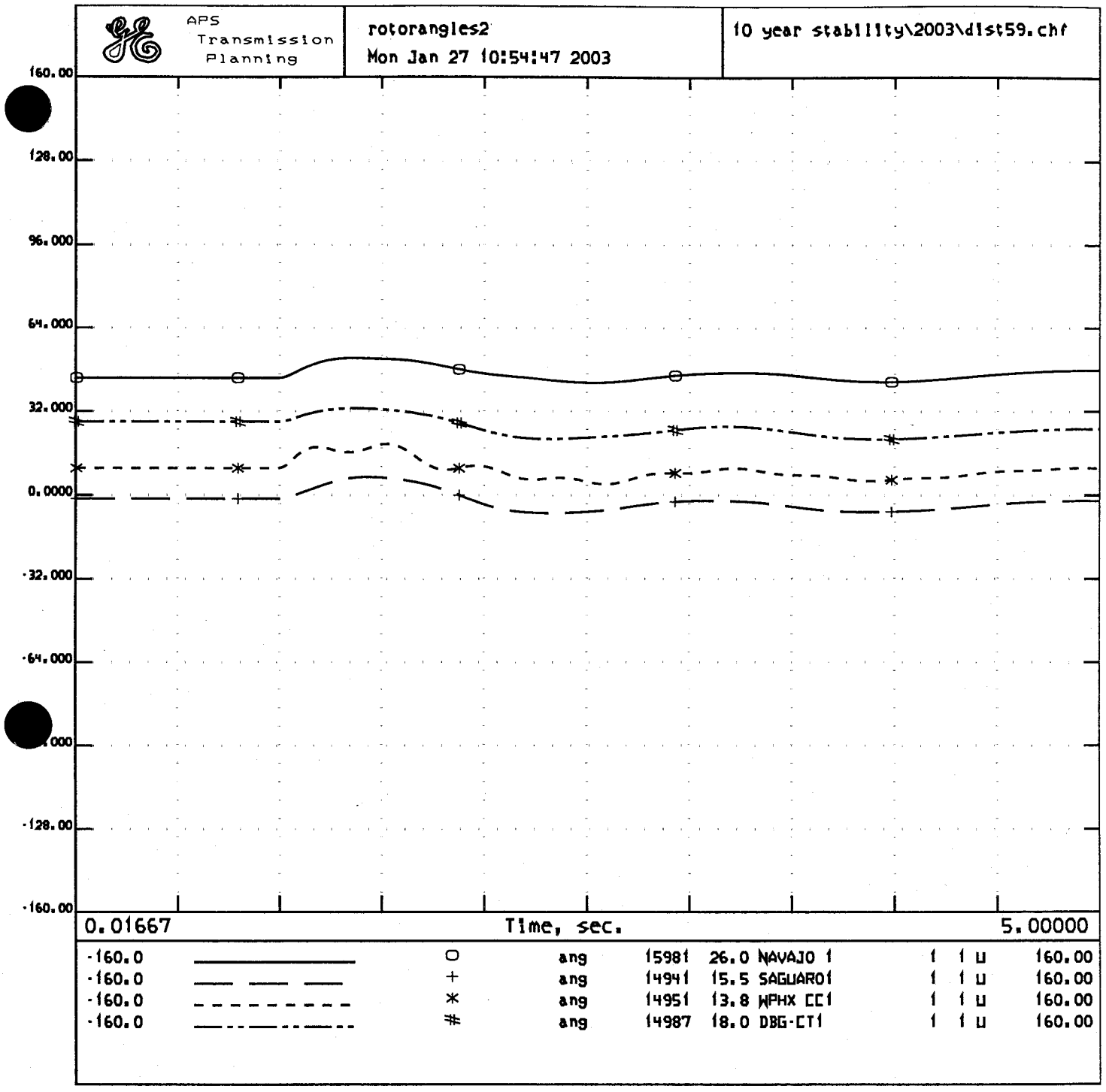
JOJOBA FLT JOJOBA-KYR LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
JJ-KYR STAB ;1; 01/03; T=0 3P FLT JJ500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/JJ-KYR;8C REIN;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



JOJOBA FLT JOJOBA-KYR LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
JJ-KYR STAB #1; 01/03; T=0 3P FLT JJ500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/JJ-KYR;8C REIN;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



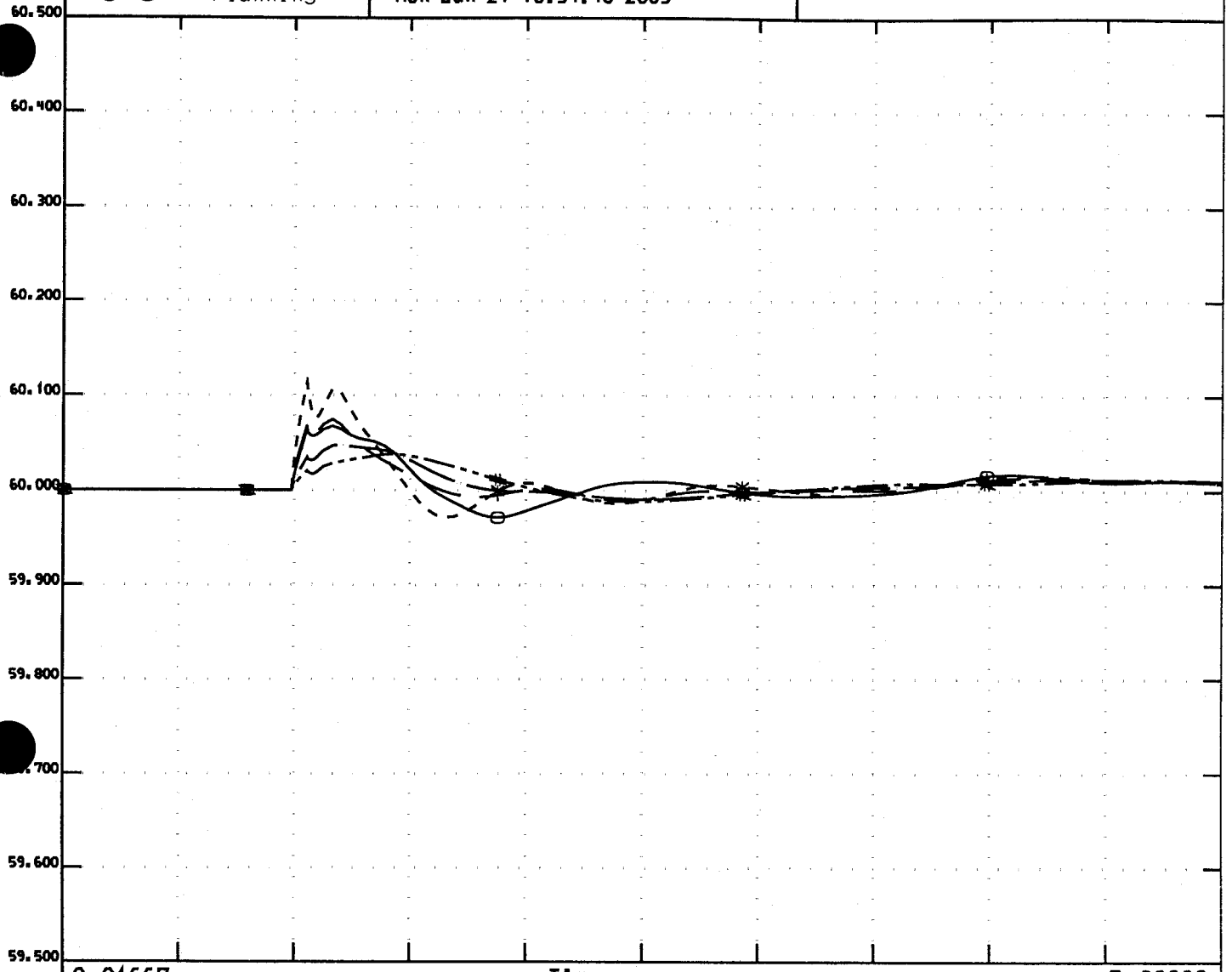
JOJOBA FLT JOJOBA-KYR LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
JJ-KYR STAB #1; 01/03; T=0 3P FLT JJ500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/JJ-KYR;8C REIN;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

APS Transmission Planning

frequencies
Mon Jan 27 10:54:48 2003

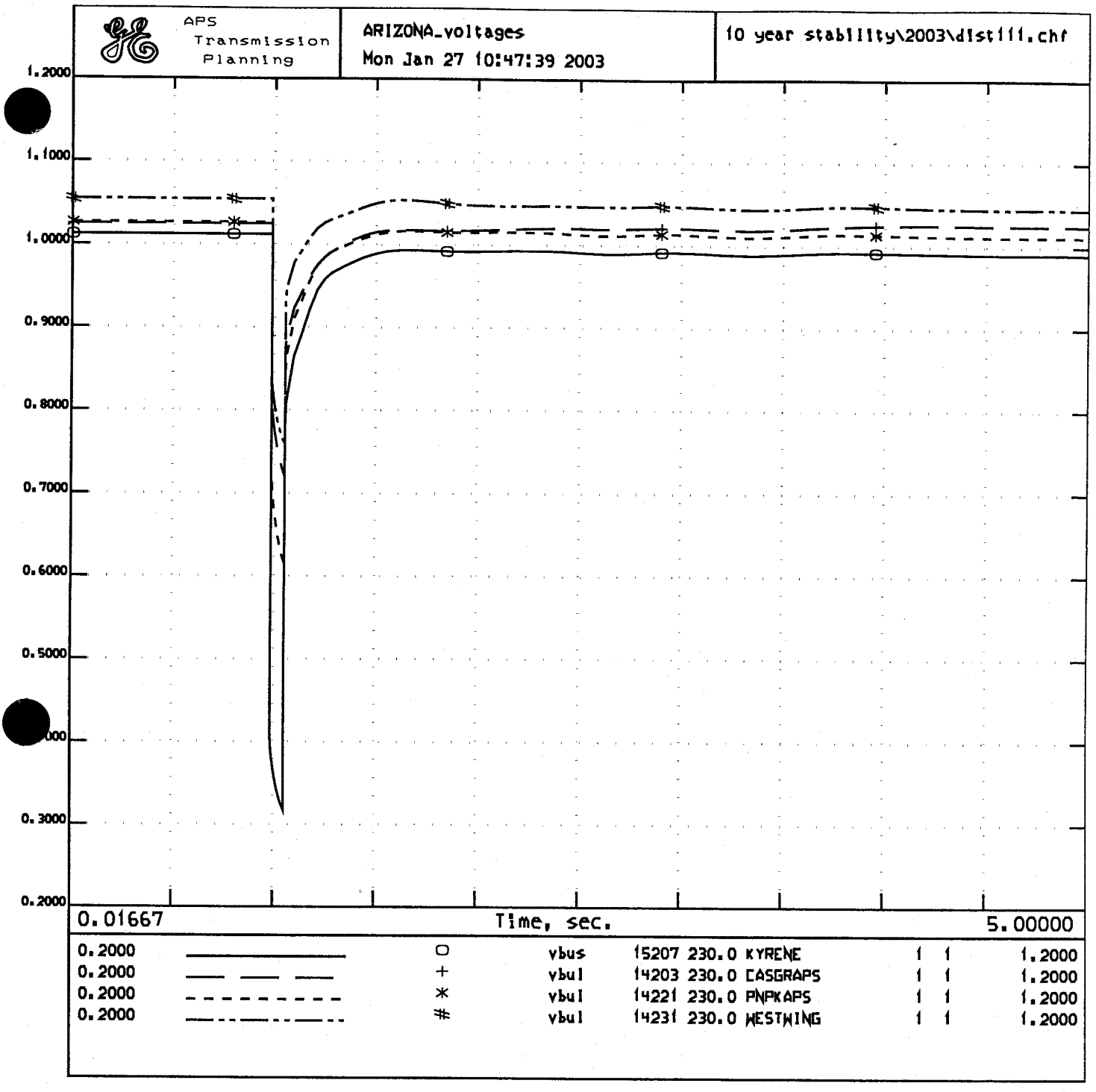
10 year stability\2003\dist59.chf



59.500	————	O	fbus	14001	500.0	FOURCORN	1	1	u	60.500
59.500	— — —	+	fbus	14003	500.0	NAVAJO	1	1	u	60.500
59.500	- - - - - - - -	*	fbul	14231	230.0	WESTWING	1	1	u	60.500
59.500	—-—-—-—	#	fbus	26003	500.0	ADELANTO	1	1	u	60.500
59.500	— — —	×	fbus	26048	500.0	MCCULLGH	1	1	u	60.500

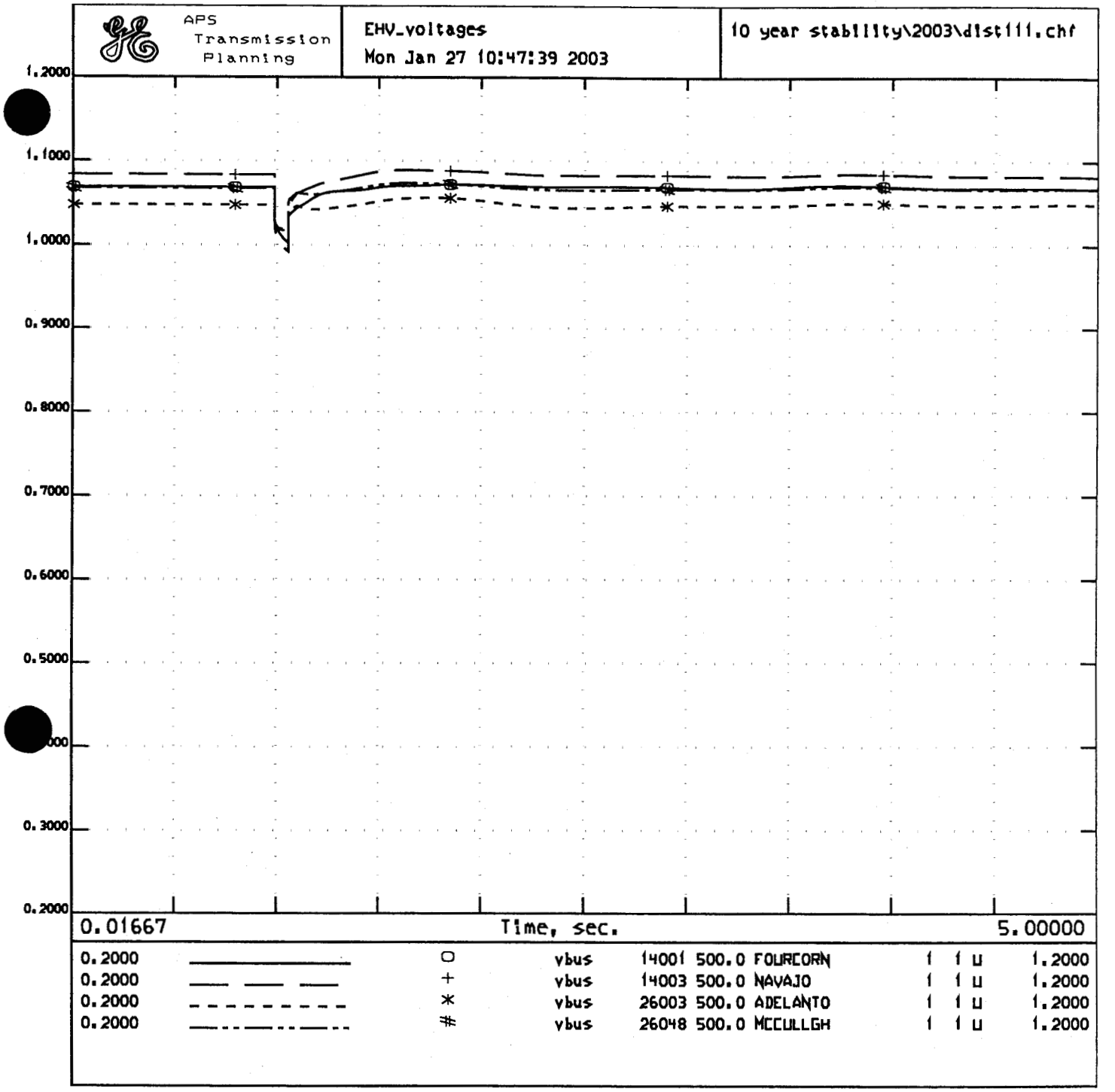
JOJOBA FLT JOJOBA-KYR LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
JJ-KYR STAB *1; 01/03; T=0 3P FLT JJ500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/JJ-KYR;8C REIN;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



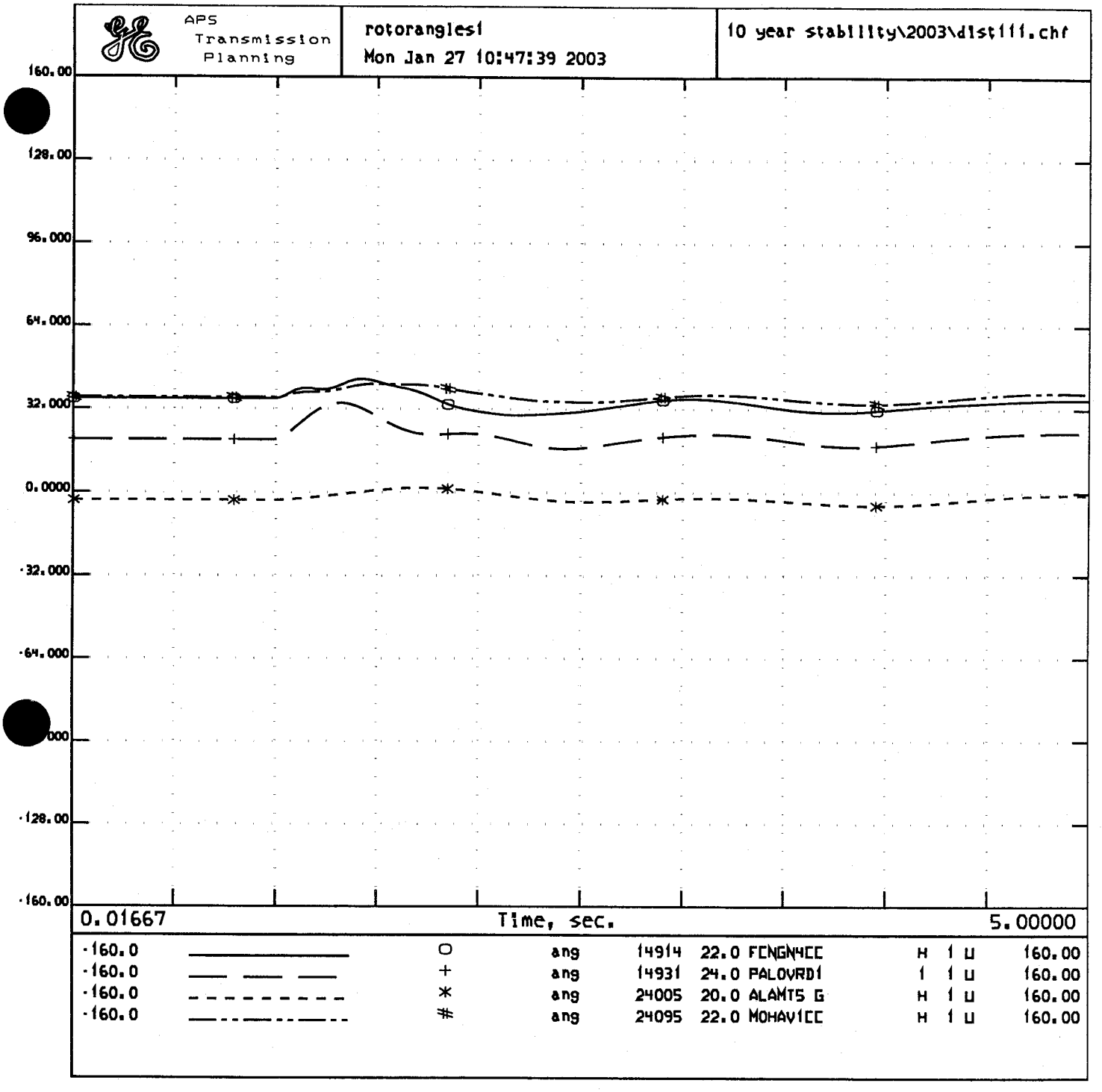
KYRENE FLT JOJOBA-KYR LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
JJ-KYR STAB #1; 01/03; T=0 3P FLT KYR500;
4C CLR FLT W/JJ-KYR;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



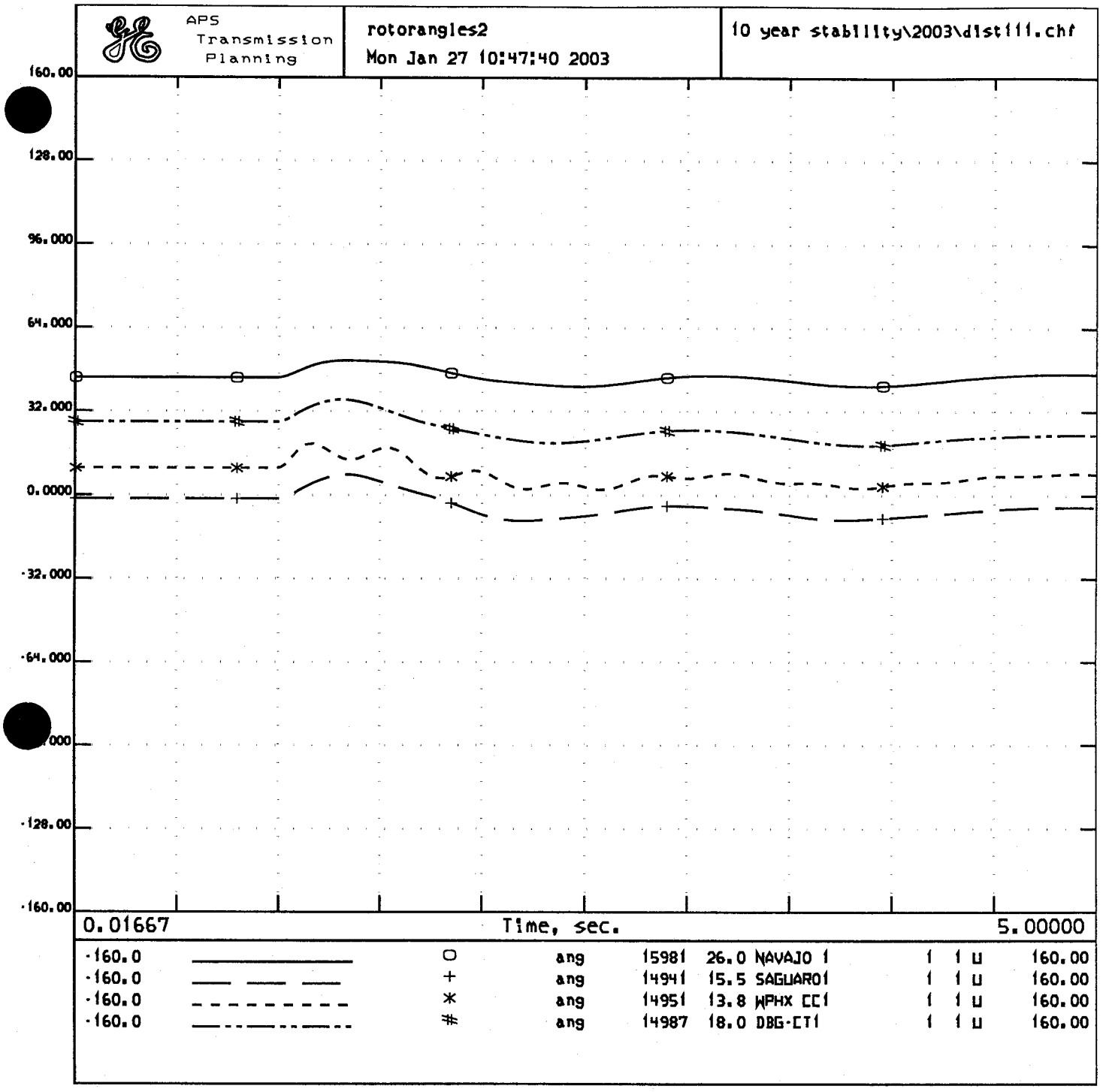
KYRENE FLT JOJOBA-KYR LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
JJ-KYR STAB •1; 01/03; T=0 3P FLT KYR500;
4C CLR FLT W/JJ-KYR;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



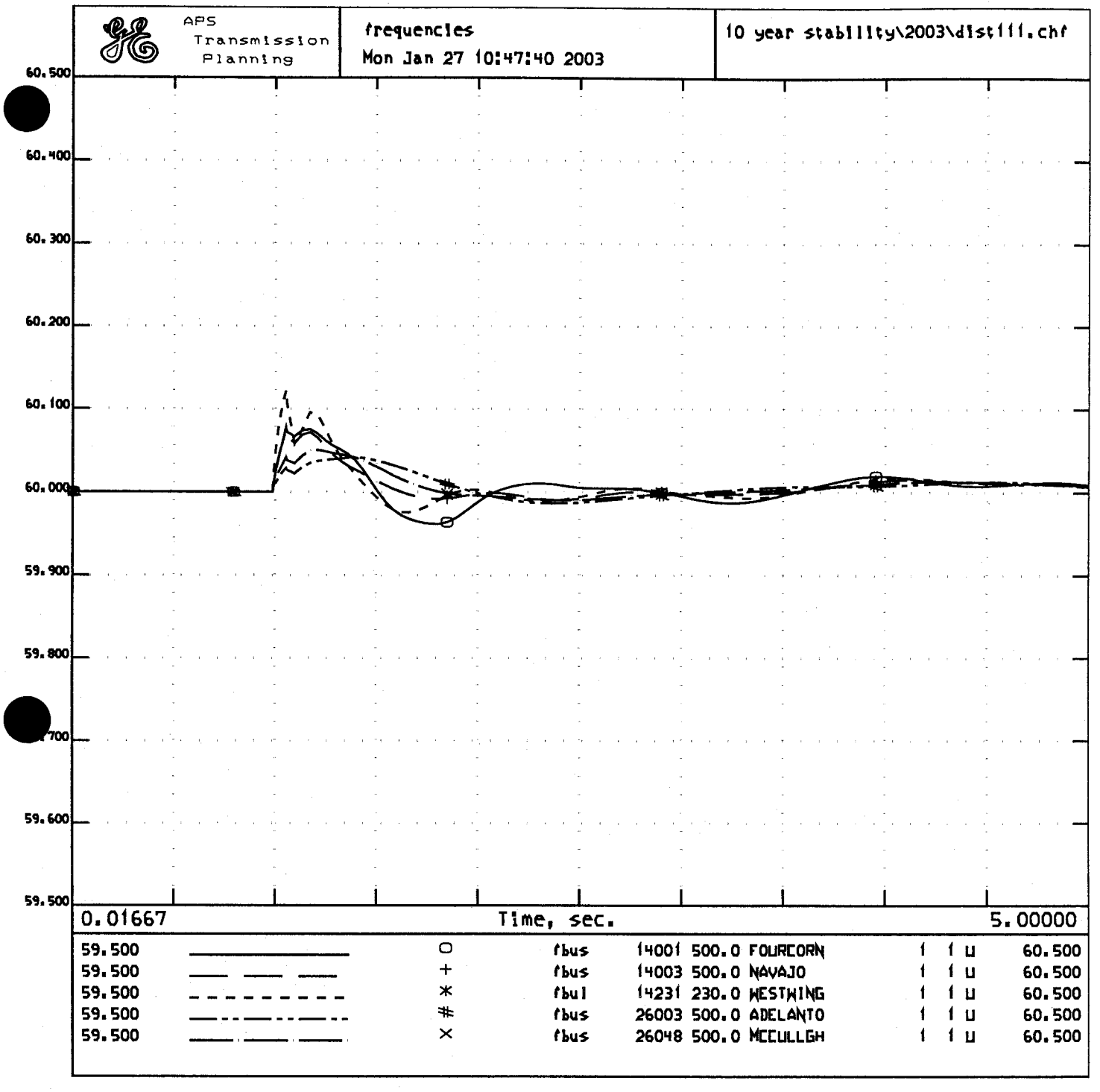
KYRENE FLT JOJOBA-KYR LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
JJ-KYR STAB #1; 01/03; T=0 3P FLT KYR500;
4C CLR FLT W/JJ-KYR;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



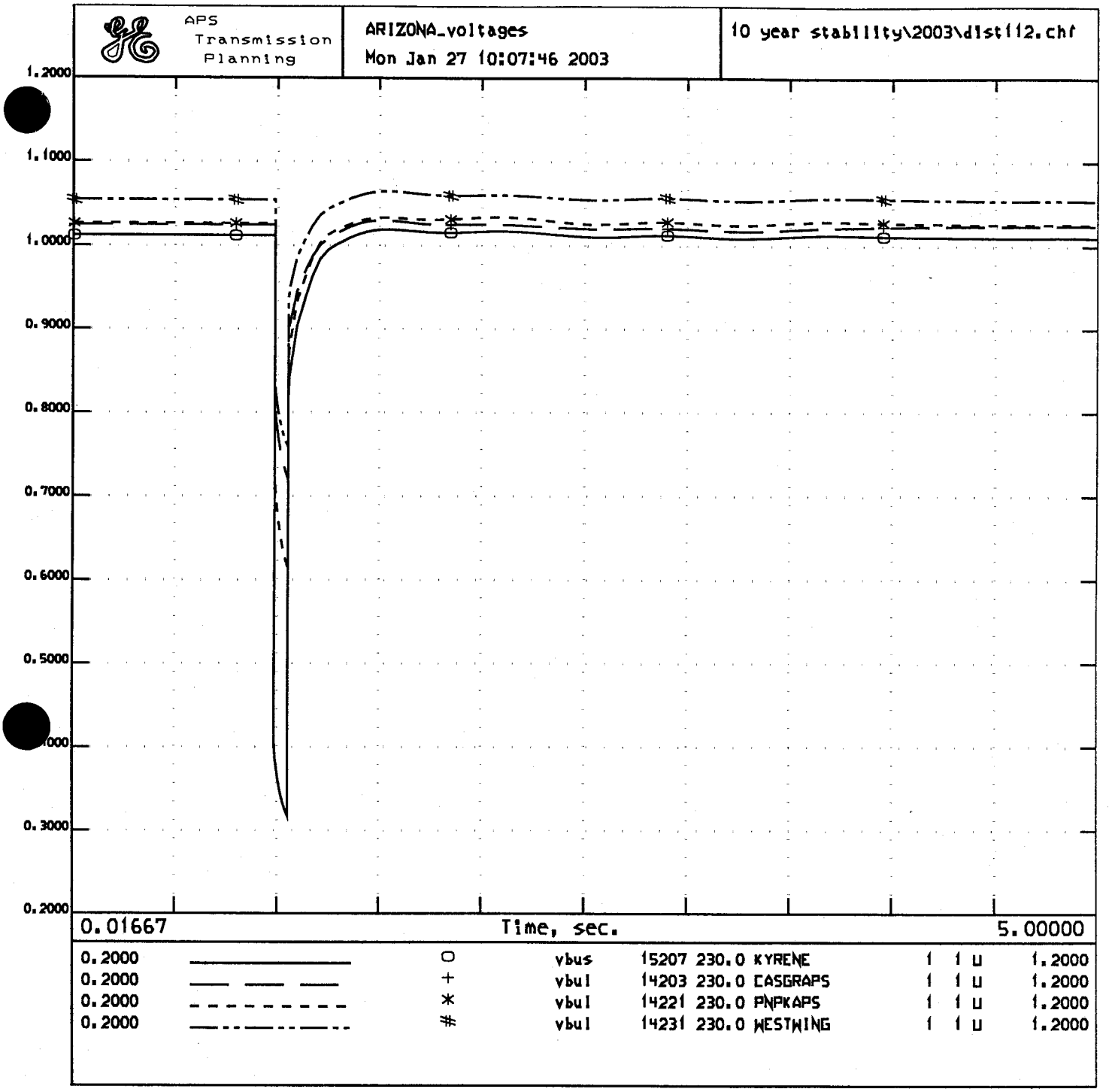
KYRENE FLT JOJOBA-KYR LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
JJ-KYR STAB #1; 01/03; T=0 3P FLT KYR500;
4C CLR FLT W/JJ-KYR;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



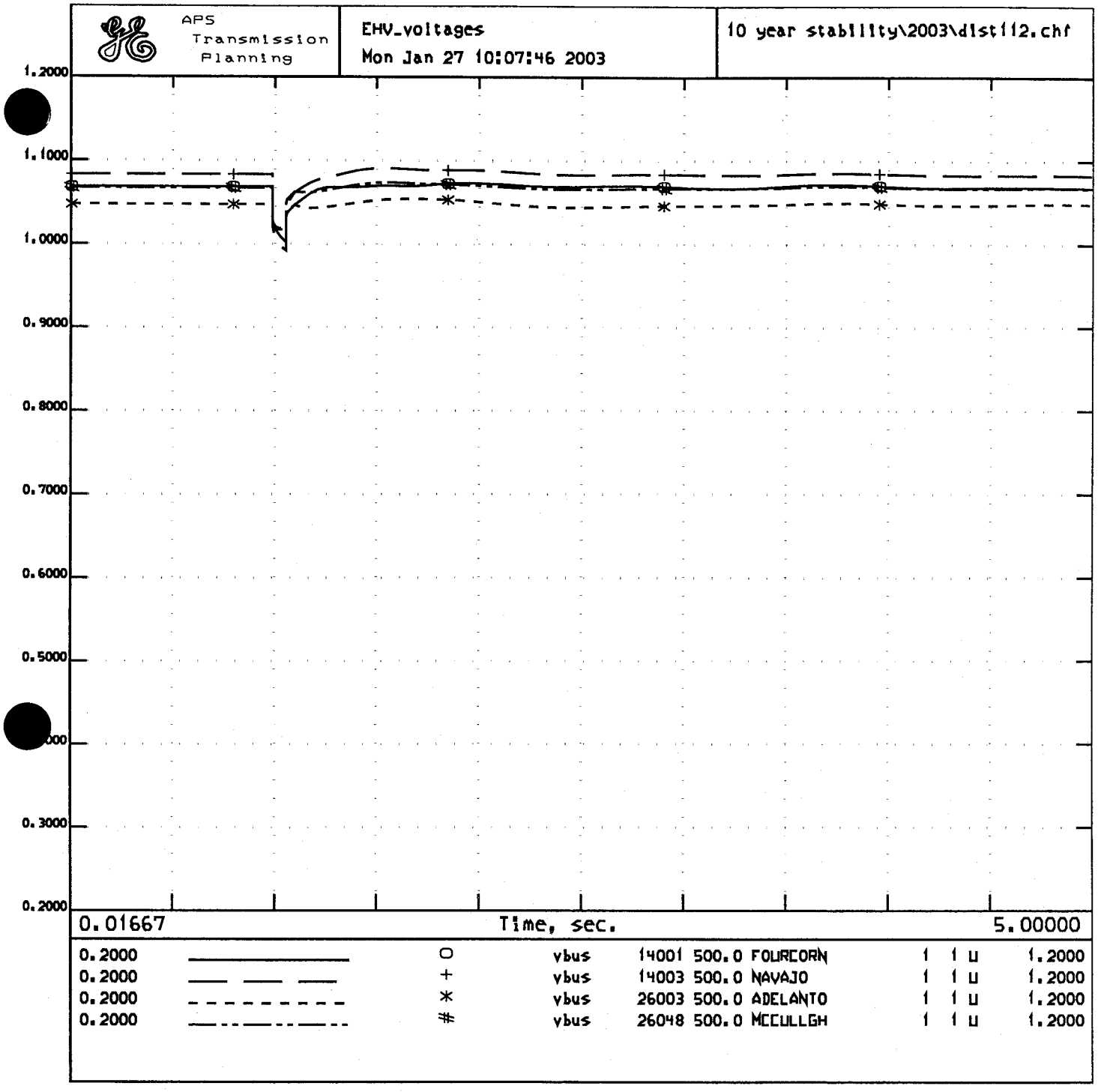
KYRENE FLT JOJOBA-KYR LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
JJ-KYR STAB #1; 01/03; T=0 3P FLT KYR500;
4C CLR FLT W/JJ-KYR;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



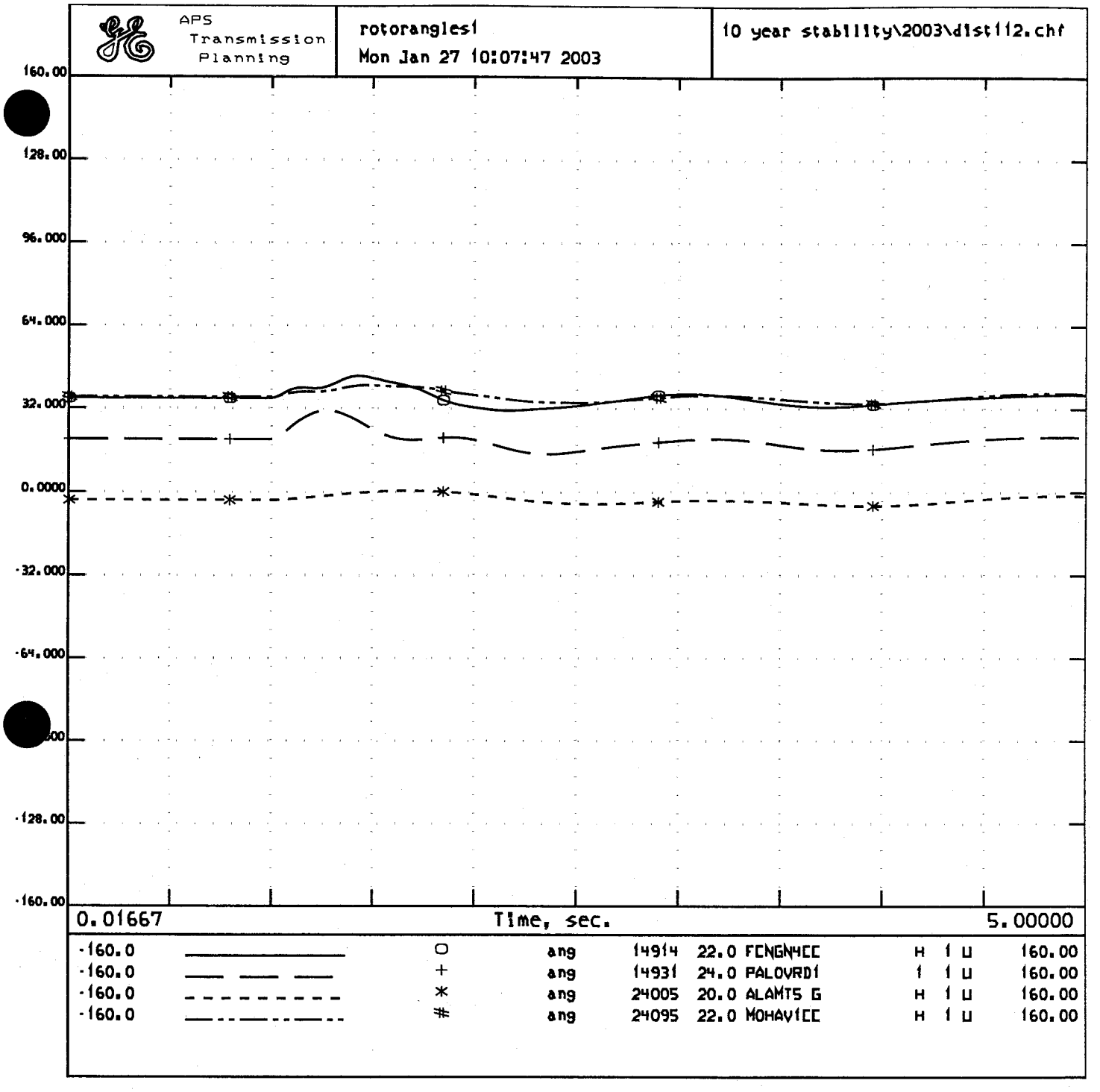
KYRENE FLT BRWN-KYR LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
BRWN-KYR STAB :1; 01/03; T=0 3P FLT KYR500;
4C CLR FLT W/BRWN-KYR;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



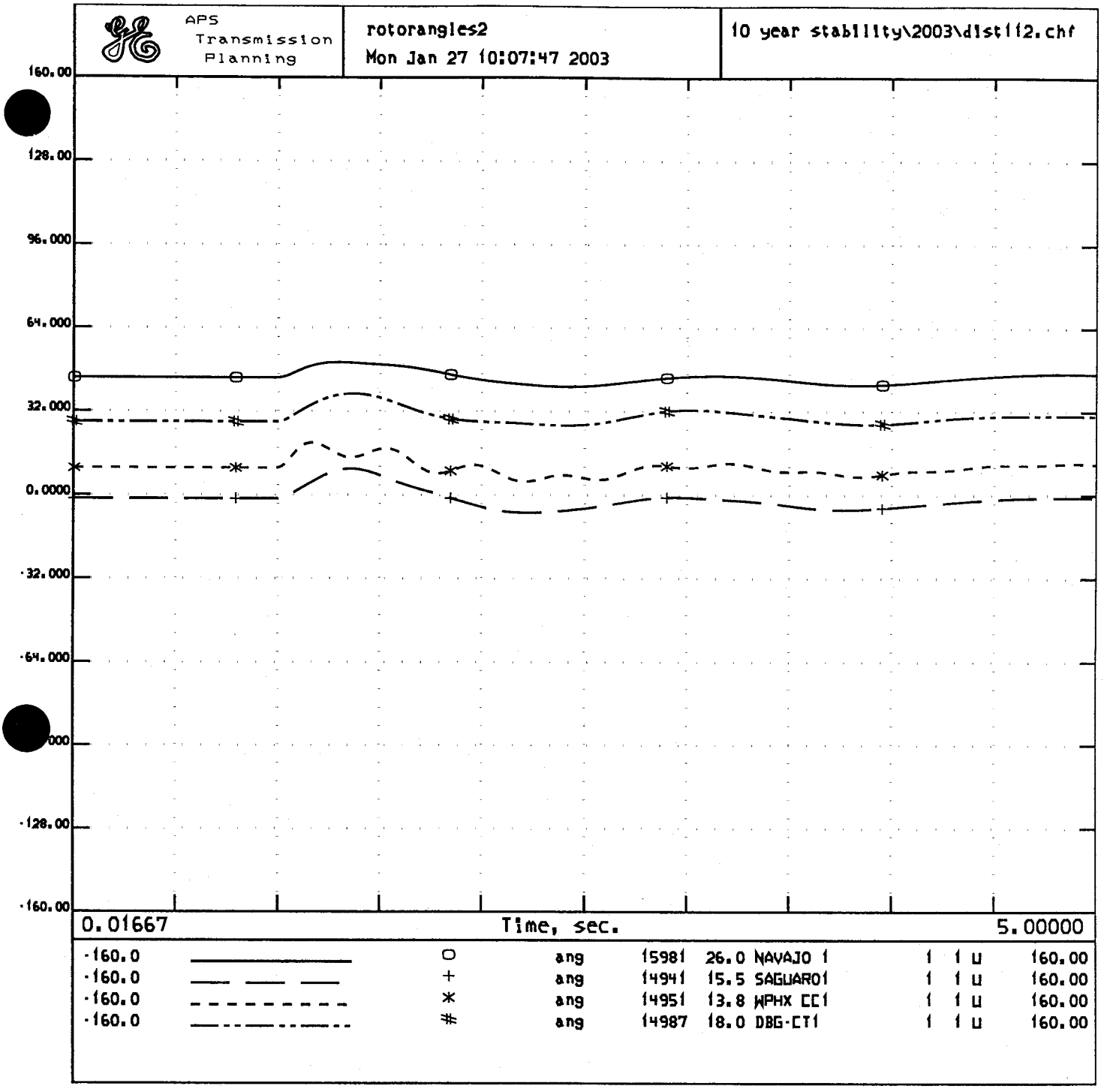
KYRENE FLT BRWN-KYR LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
BRWN-KYR STAB #1; 01/03; T=0 3P FLT KYR500;
4C CLR FLT W/BRWN-KYR;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



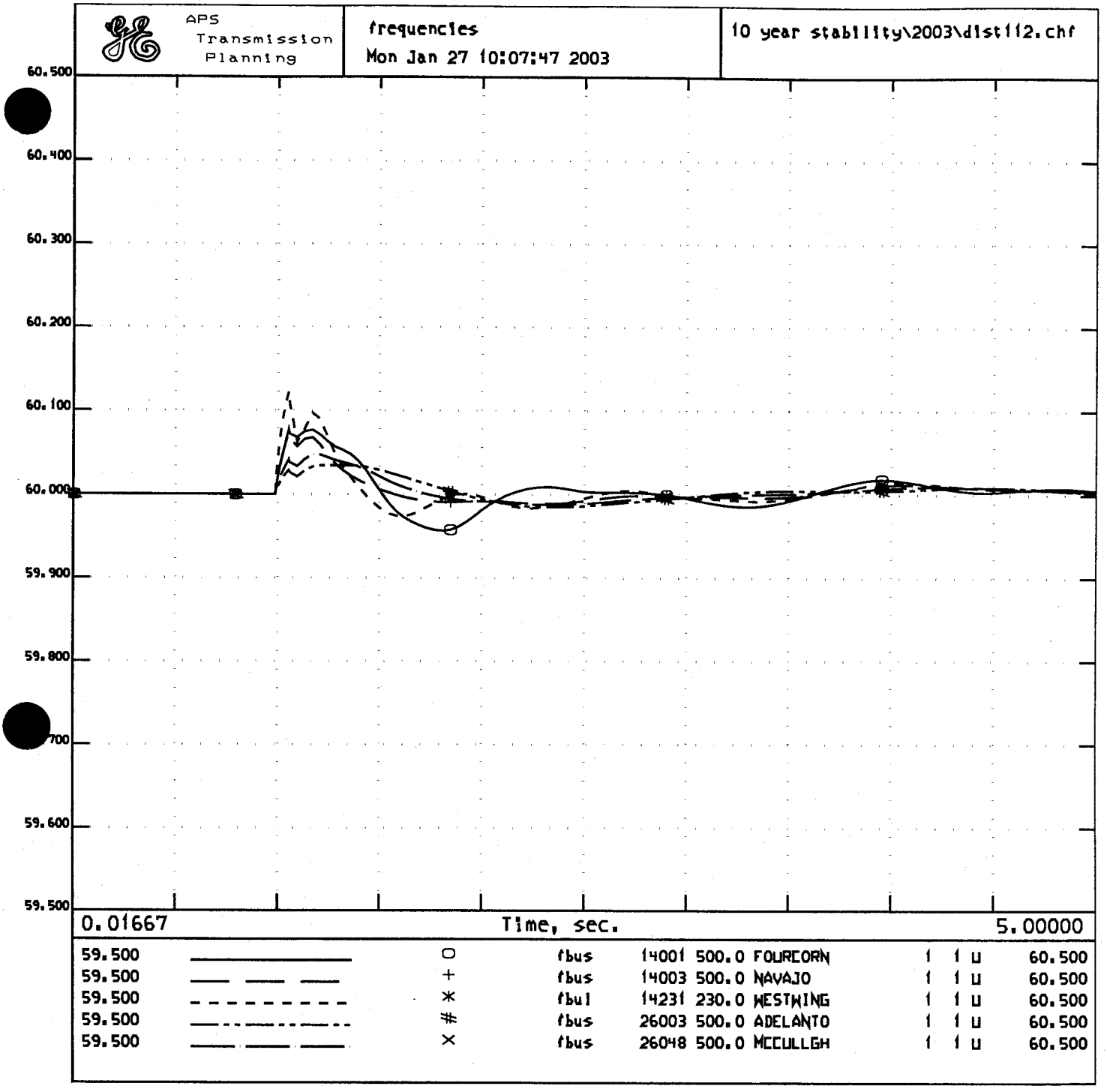
KYRENE FLT BRWN-KYR LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
BRWN-KYR STAB #1; 01/03; T=0 3P FLT KYR500;
4C CLR FLT W/BRWN-KYR;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



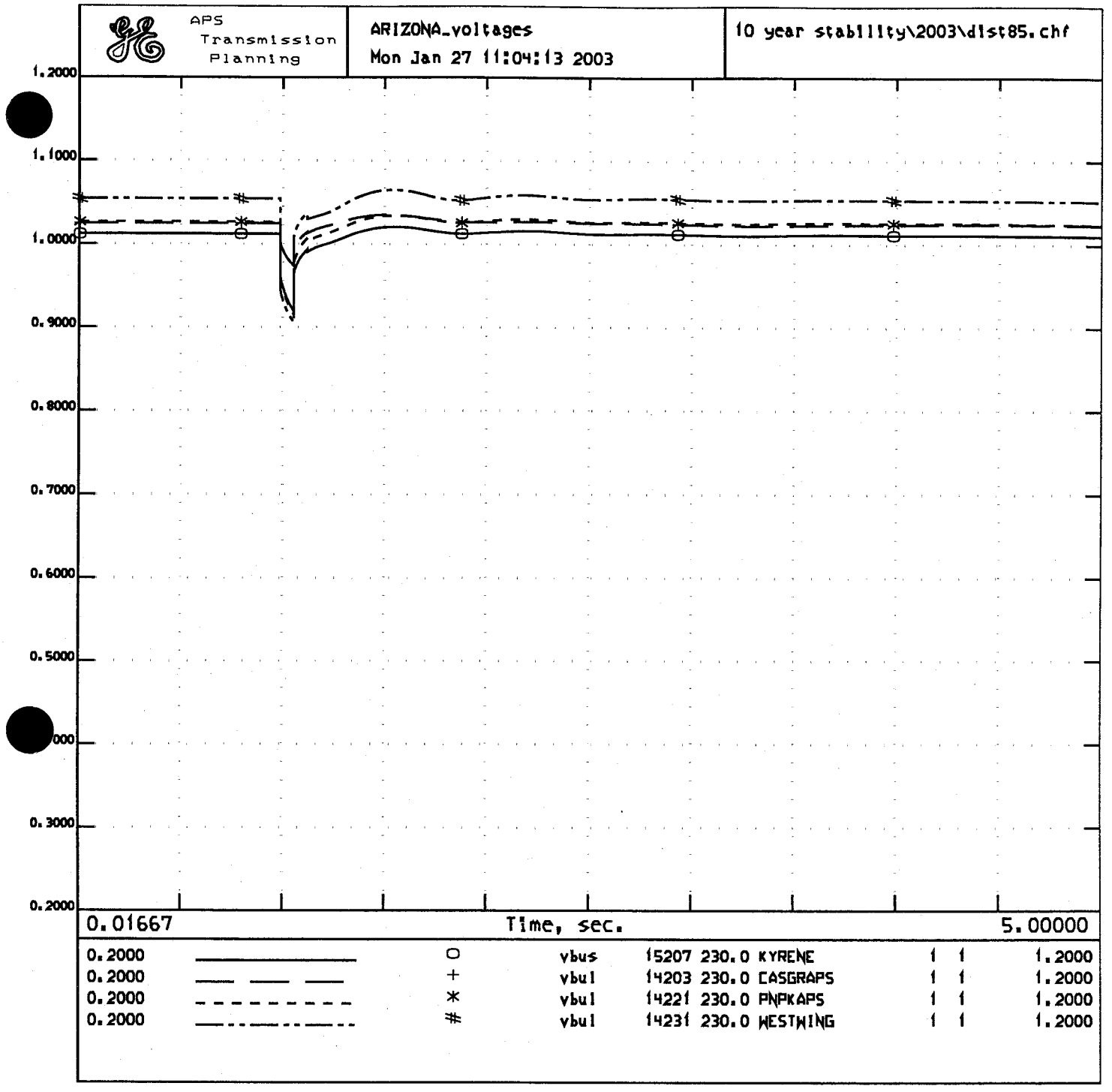
KYRENE FLT BRWN-KYR LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
BRWN-KYR STAB #1; 01/03; T=0 3P FLT KYR500;
4C CLR FLT W/BRWN-KYR;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



KYRENE FLT BRWN-KYR LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
BRWN-KYR STAB :1; 01/03; T=0 3P FLT KYR500;
4C CLR FLT W/BRWN-KYR;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



WESTERN SYSTEMS COORDINATING COUNCIL
MKP FLT. MKP-ELD line out
OCTOBER 29, 2001
MKP-ELD STAB; 1/03; T=0 3P FLT MKP500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/MKP-ELD;8C REIN;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

APS Transmission Planning

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Mon Jan 27 11:04:14 2003

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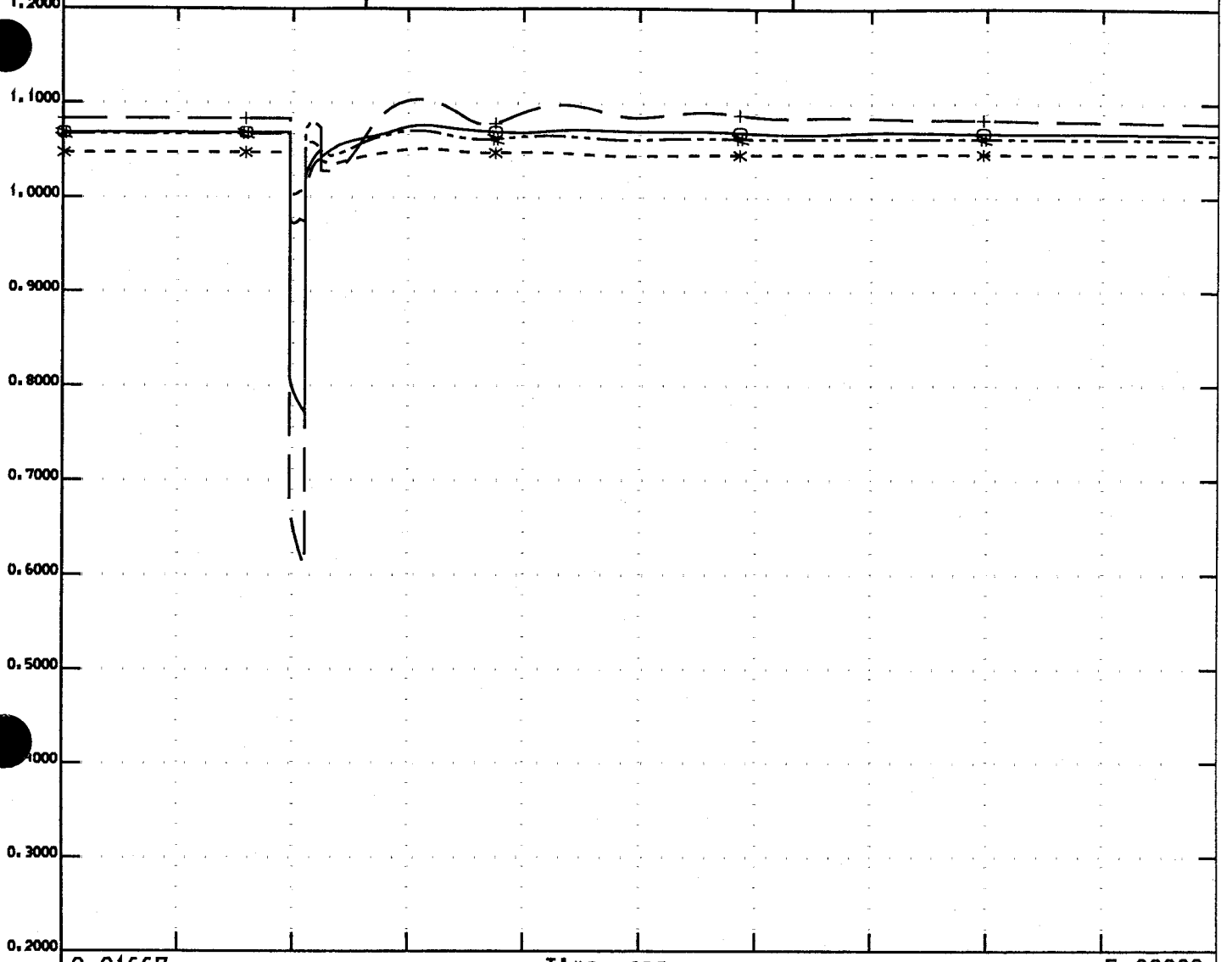
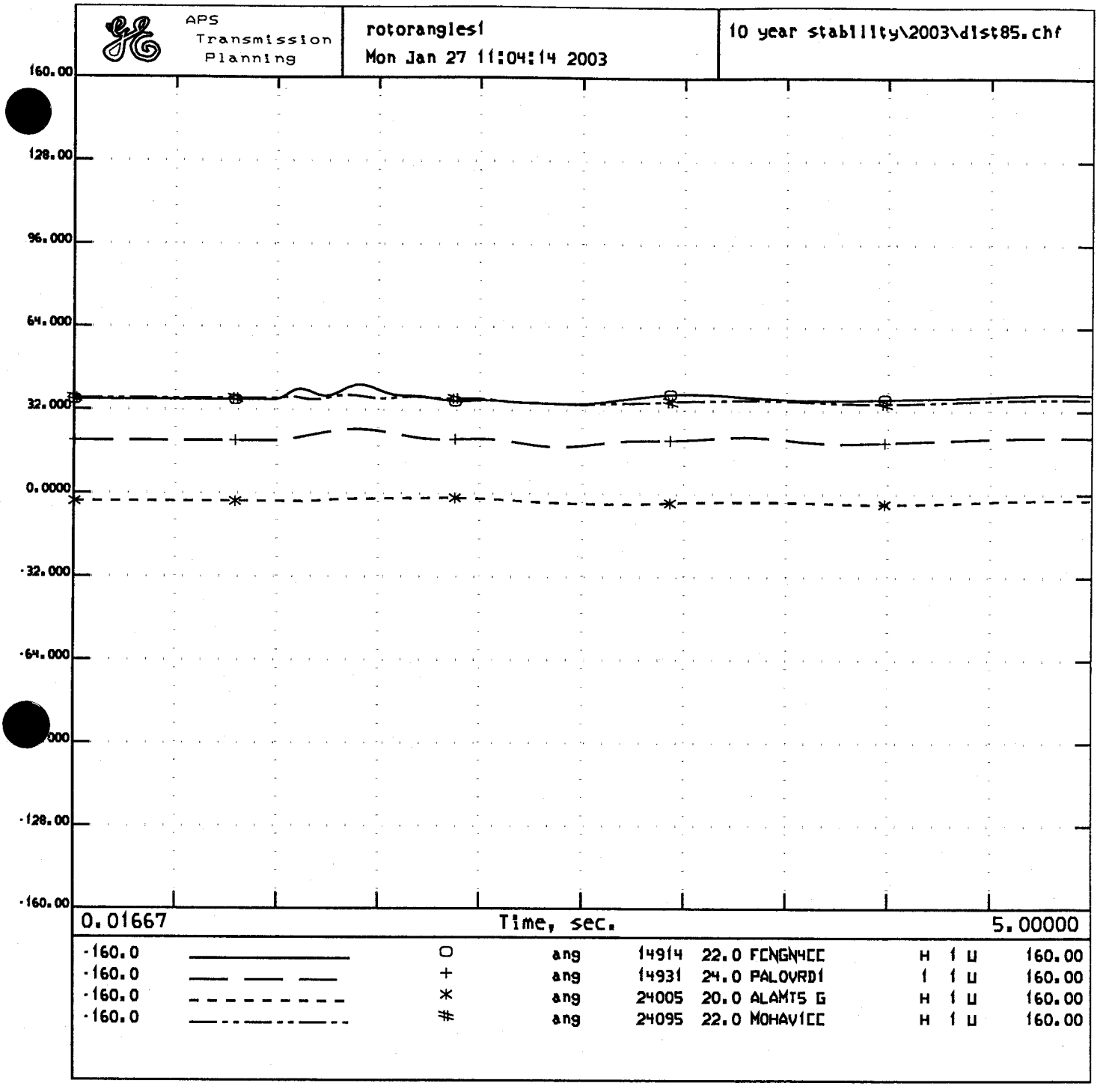


0.01667 Time, sec. 5.00000

0.2000	————	O	vbus	14001	500.0	FOURCORN	1 1 u	1.2000
0.2000	— — —	+	vbus	14003	500.0	NAVAJO	1 1 u	1.2000
0.2000	- - - - - - - -	*	vbus	26003	500.0	ADELANTO	1 1 u	1.2000
0.2000	—-—-—-	#	vbus	26048	500.0	MCCULLGH	1 1 u	1.2000

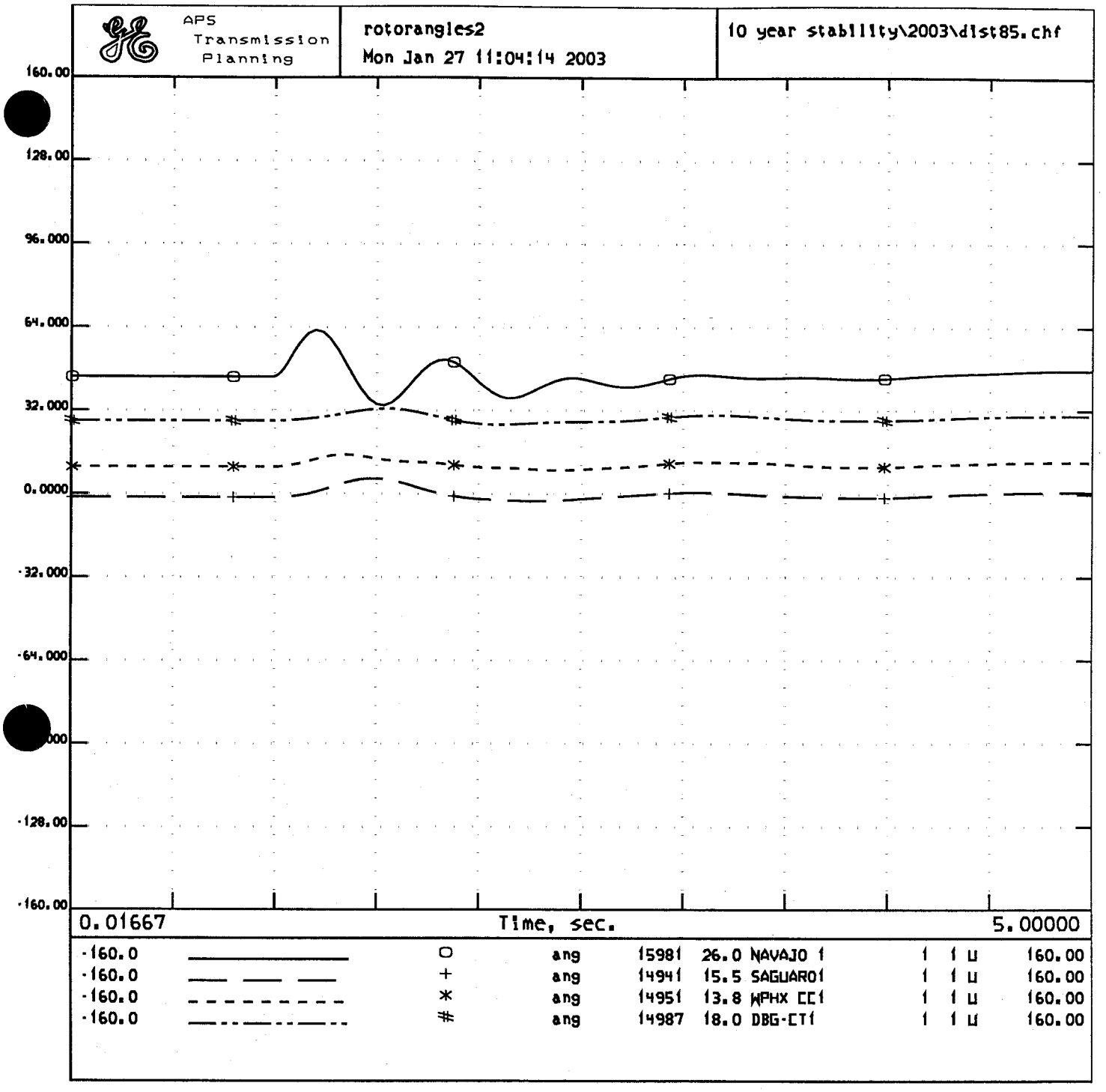
WESTERN SYSTEMS COORDINATING COUNCIL
MKP FLT. MKP-ELD line out
OCTOBER 29, 2001
MKP-ELD STAB; 1/03; T=0 3P FLT MKP500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/MKP-ELD;8C REIN;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



WESTERN SYSTEMS COORDINATING COUNCIL
MKP FLT. MKP-ELD line out
OCTOBER 29, 2001
MKP-ELD STAB; 1/03; T=0 3P FLT MKP500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/MKP-ELD;8C REIN;2003.dyd;WSCC.bat

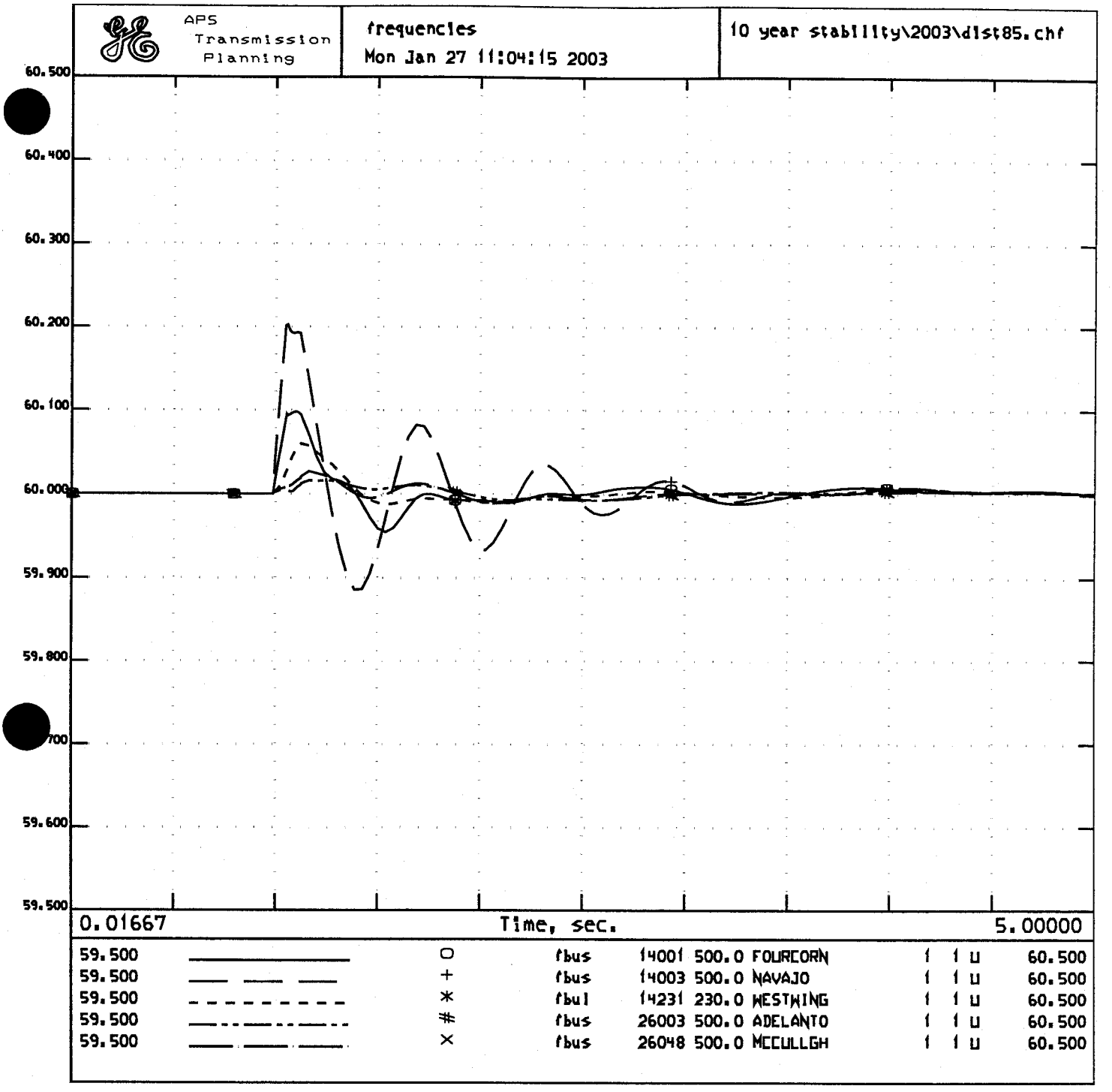
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



WESTERN SYSTEMS COORDINATING COUNCIL
MKP FLT. MKP-ELD line out
OCTOBER 29, 2001
MKP-ELD STAB; 1/03; T=0 3P FLT MKP500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/MKP-ELD;8C REIN;2003.dyd;WSCC.bat

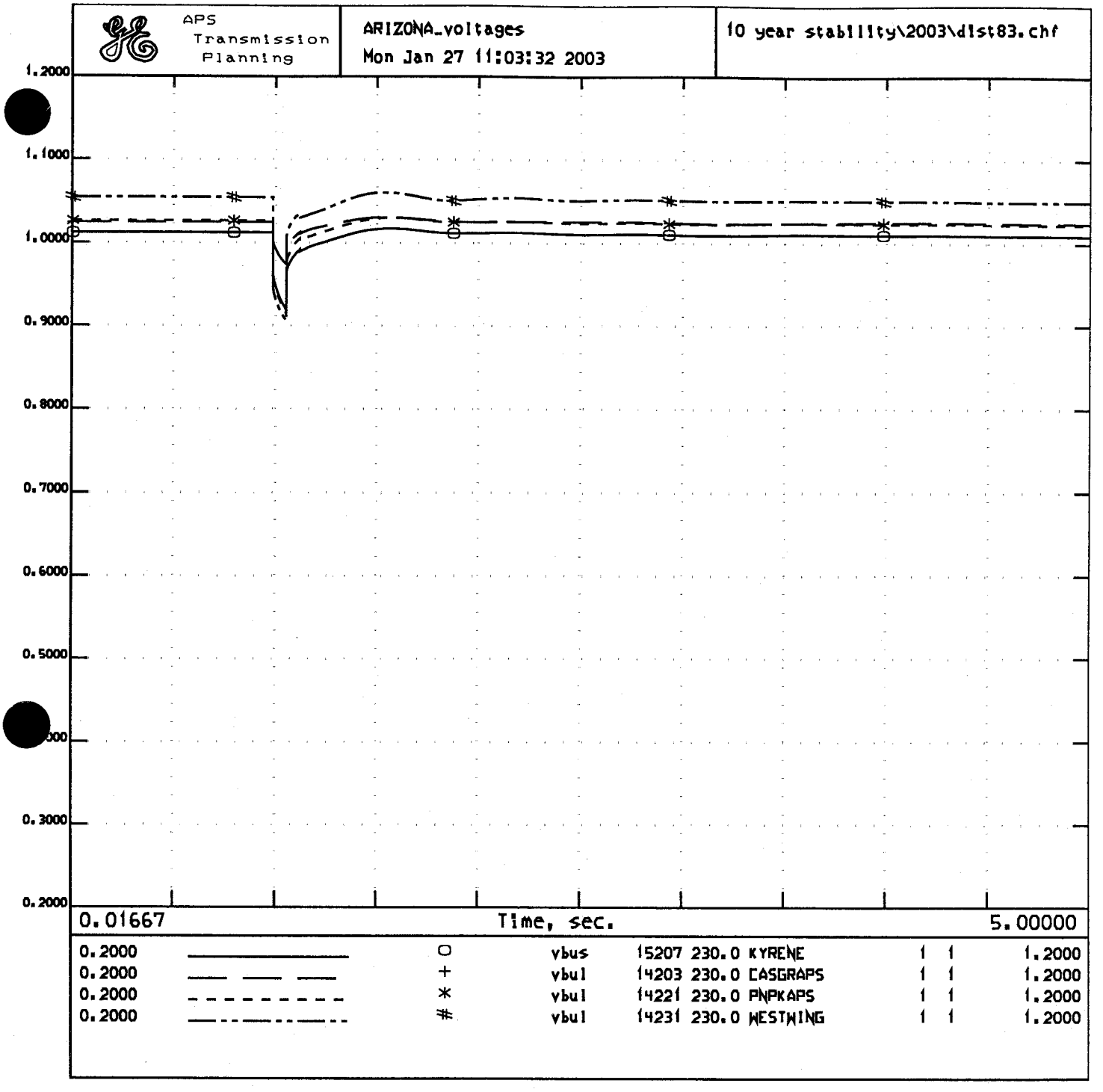
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

B54



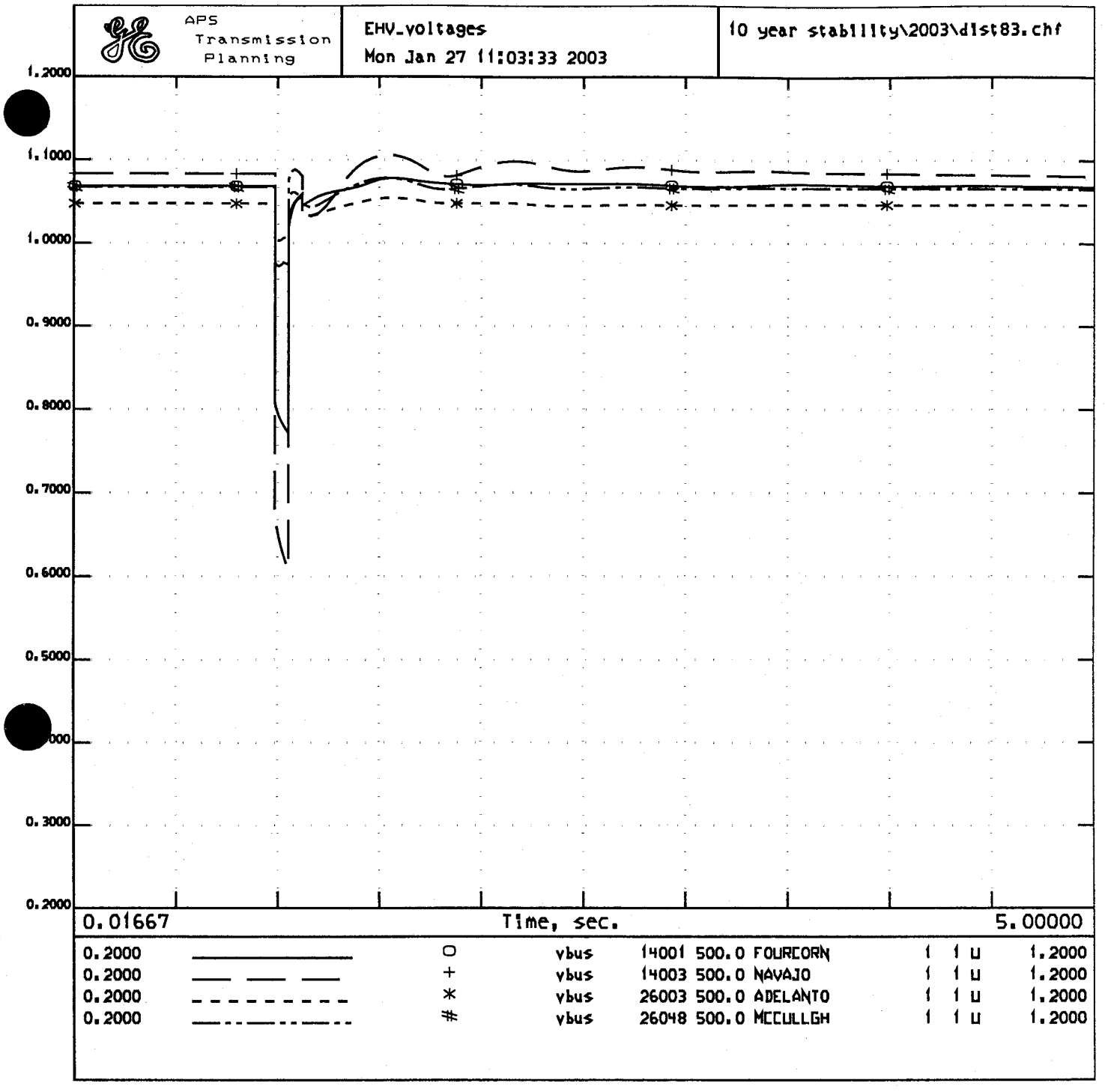
WESTERN SYSTEMS COORDINATING COUNCIL
MKP FLT. MKP-ELD line out
OCTOBER 29, 2001
MKP-ELD STAB; 1/03; T=0 3P FLT MKP500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/MKP-ELD;8C REIN;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



MKP. FLT MKP-YAV line out
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
MKP-YAV STAB; 1/03; T=0 3P FLT MKP500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/MKP-YAV;8C REIN;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



MKP. FLT MKP-YAV line out
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
MKP-YAV STAB; 1/03; T=0 3P FLT MKP500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/MKP-YAV;8C REIN;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

APS Transmission Planning

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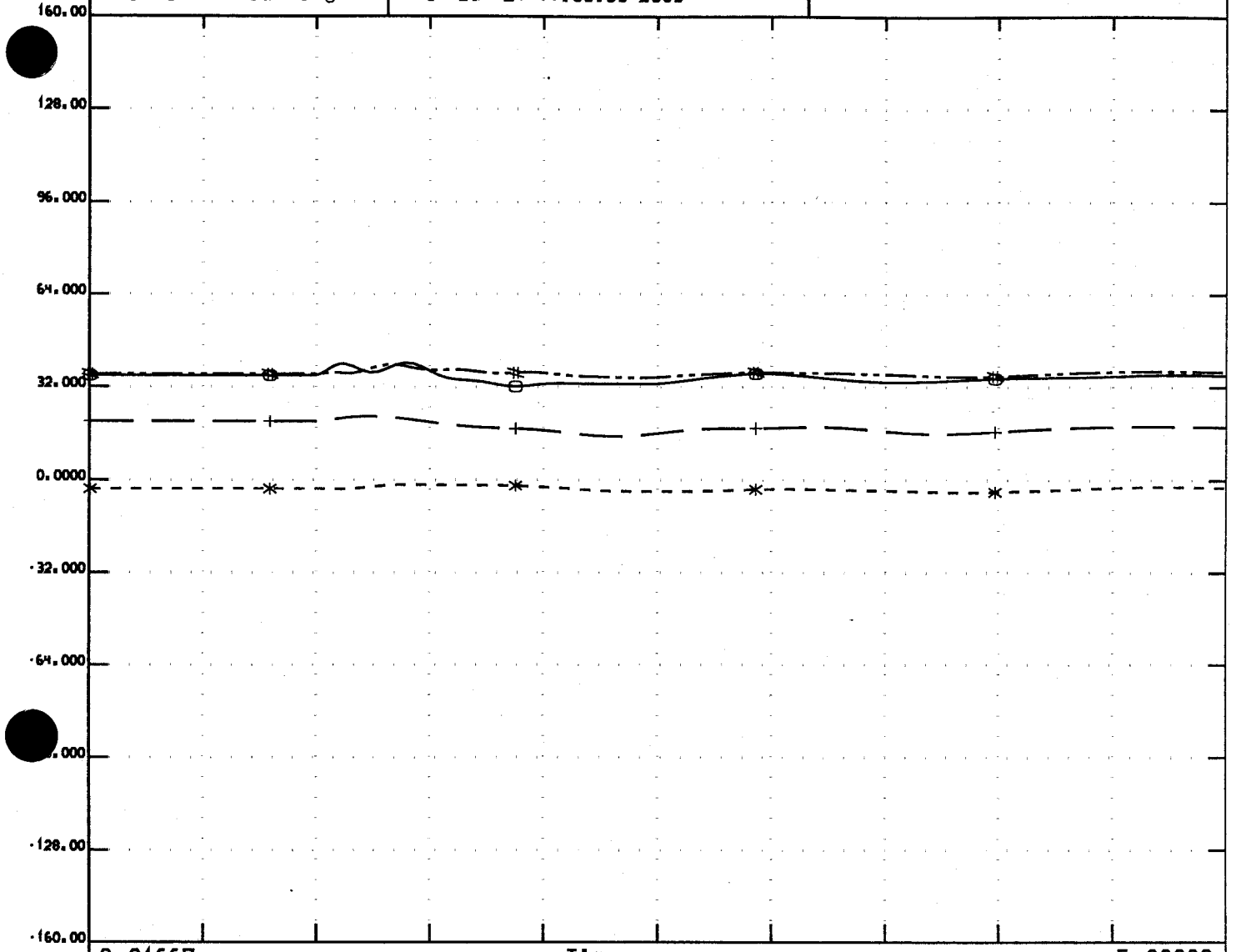
Mon Jan 27 11:03:33 2003

10 year stability\2003\dist83.chf

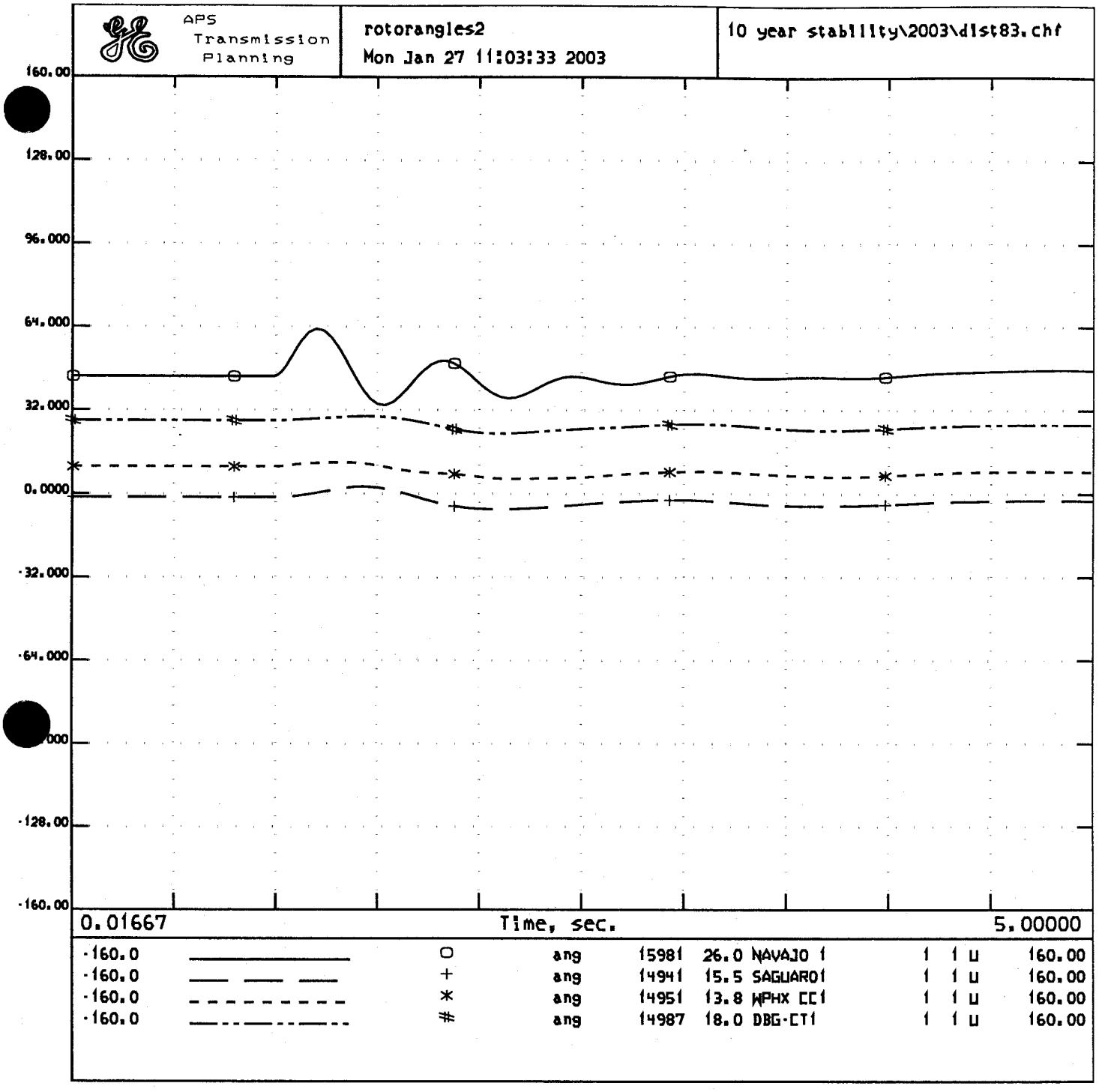


0.01667 Time, sec. 5.00000

-160.0	————————	O	ang	14914	22.0	FENGN4CC	H	1	u	160.00
-160.0	— — —	+	ang	14931	24.0	PALOVRD1	1	1	u	160.00
-160.0	- - - - - - - - -	*	ang	24005	20.0	ALAMT5 G	H	1	u	160.00
-160.0	—-—-—-—	#	ang	24095	22.0	MOHAV1CC	H	1	u	160.00

MKP, FLT MKP-YAV line out
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
MKP-YAV STAB; 1/03; T-O 3P FLT MKP500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/MKP-YAV;8C REIN;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



MKP. FLT MKP-YAV line out
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
MKP-YAV STAB; 1/03; T=0 3P FLT MKP500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/MKP-YAV;8C REIN;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

APS Transmission Planning

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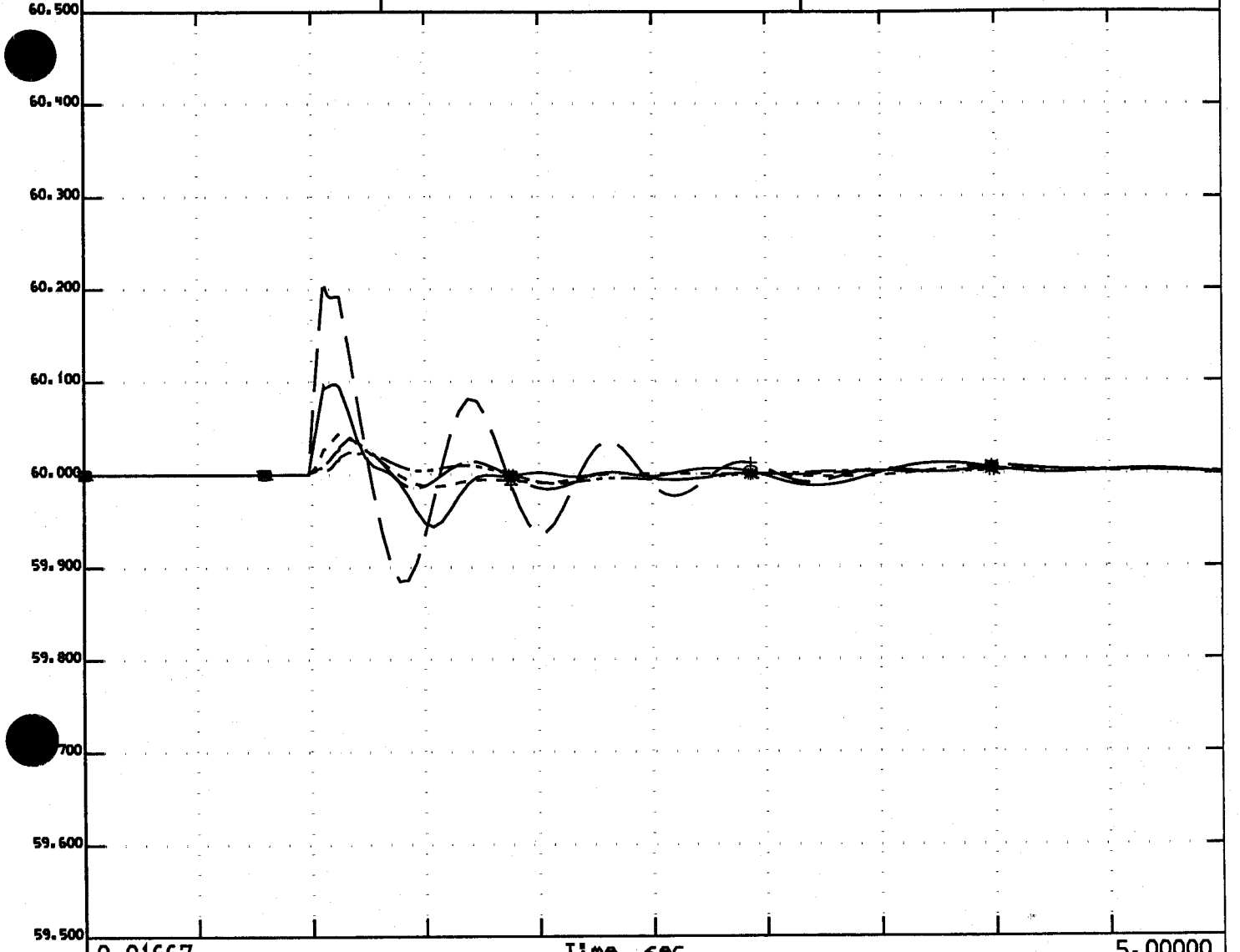
Mon Jan 27 11:03:34 2003

10 year stability\2003\dist83.chf

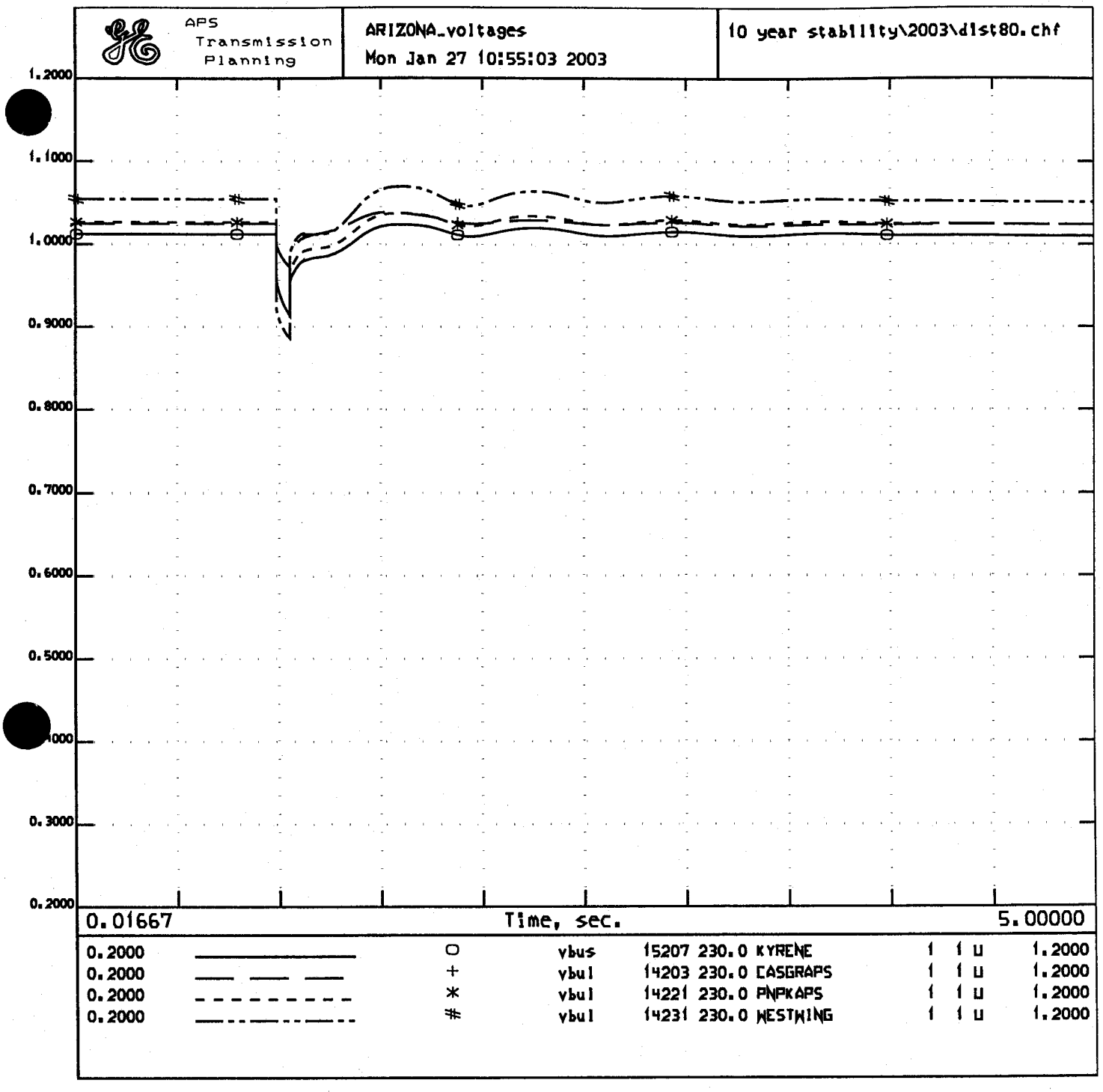


59.500	———	O	fbus	14001	500.0	FOURCORN	1	1 u	60.500
59.500	— — —	+	fbus	14003	500.0	NAVAJO	1	1 u	60.500
59.500	- - - - - - - - -	*	fbul	14231	230.0	WESTWING	1	1 u	60.500
59.500	—-—-—-—	#	fbus	26003	500.0	ADELANTO	1	1 u	60.500
59.500	—.—.—	×	fbus	26048	500.0	MCCULLGH	1	1 u	60.500

MKP. FLT MKP-YAV line out
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
MKP-YAV STAB; 1/03; T=0 3P FLT MKP500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/MKP-YAV;8C REIN;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

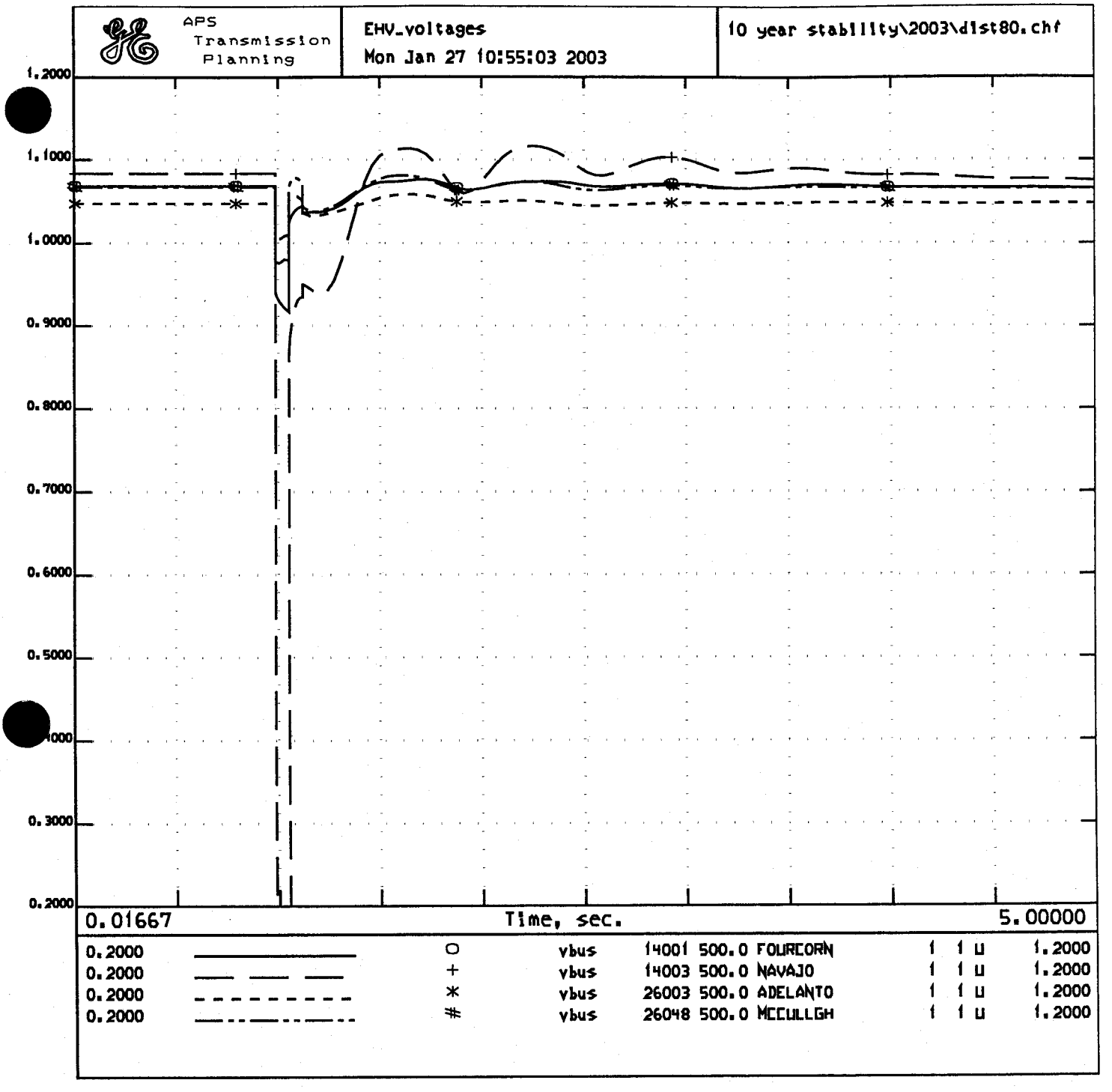
B60



WESTERN SYSTEMS COORDINATING COUNCIL
NAV. FLT. Nav-Crystal line out
OCTOBER 29, 2001
NAV-CRYS STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-CRYS;8C REIN;2003.dyd;WSCC.bat

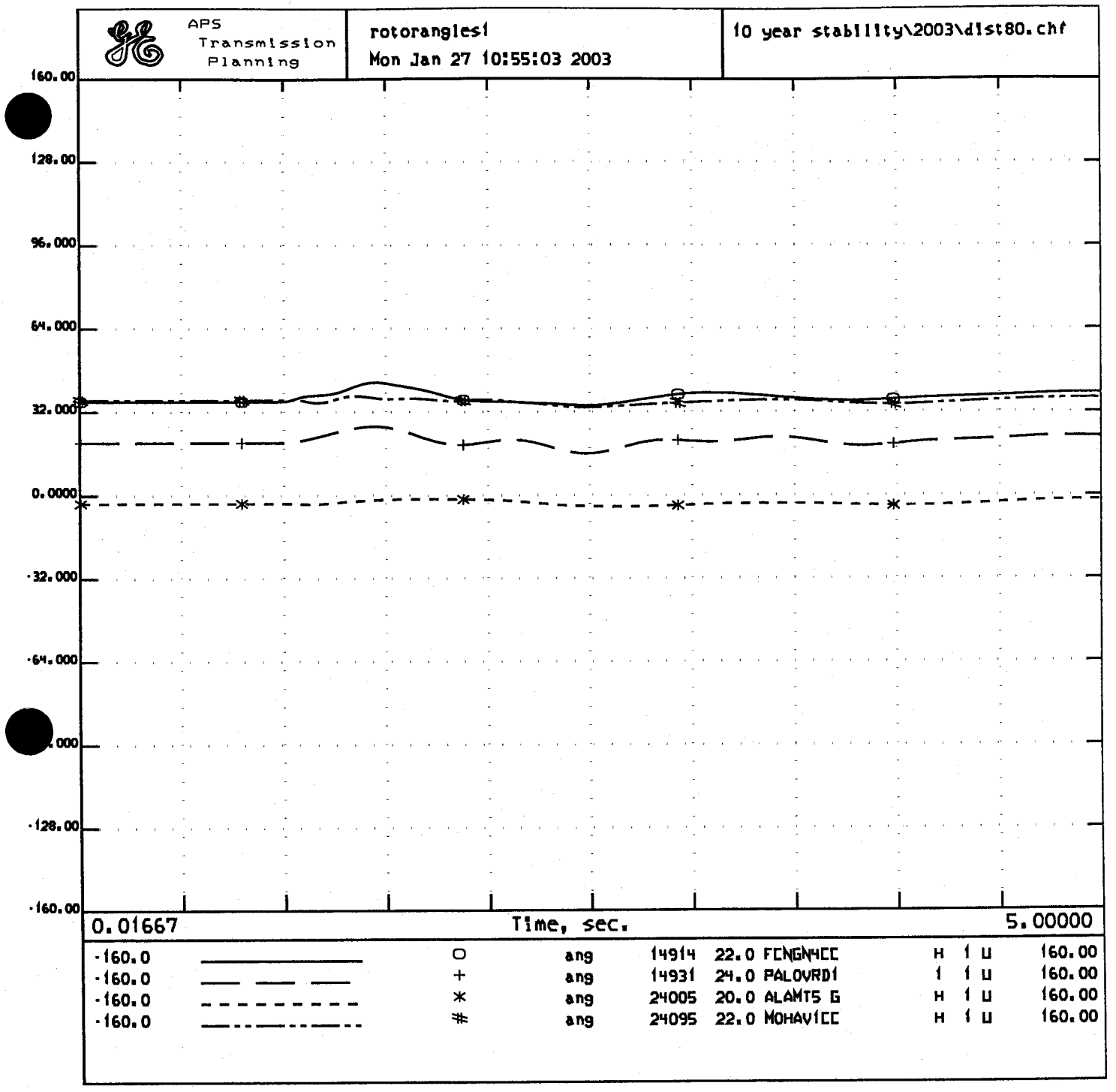
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

B61



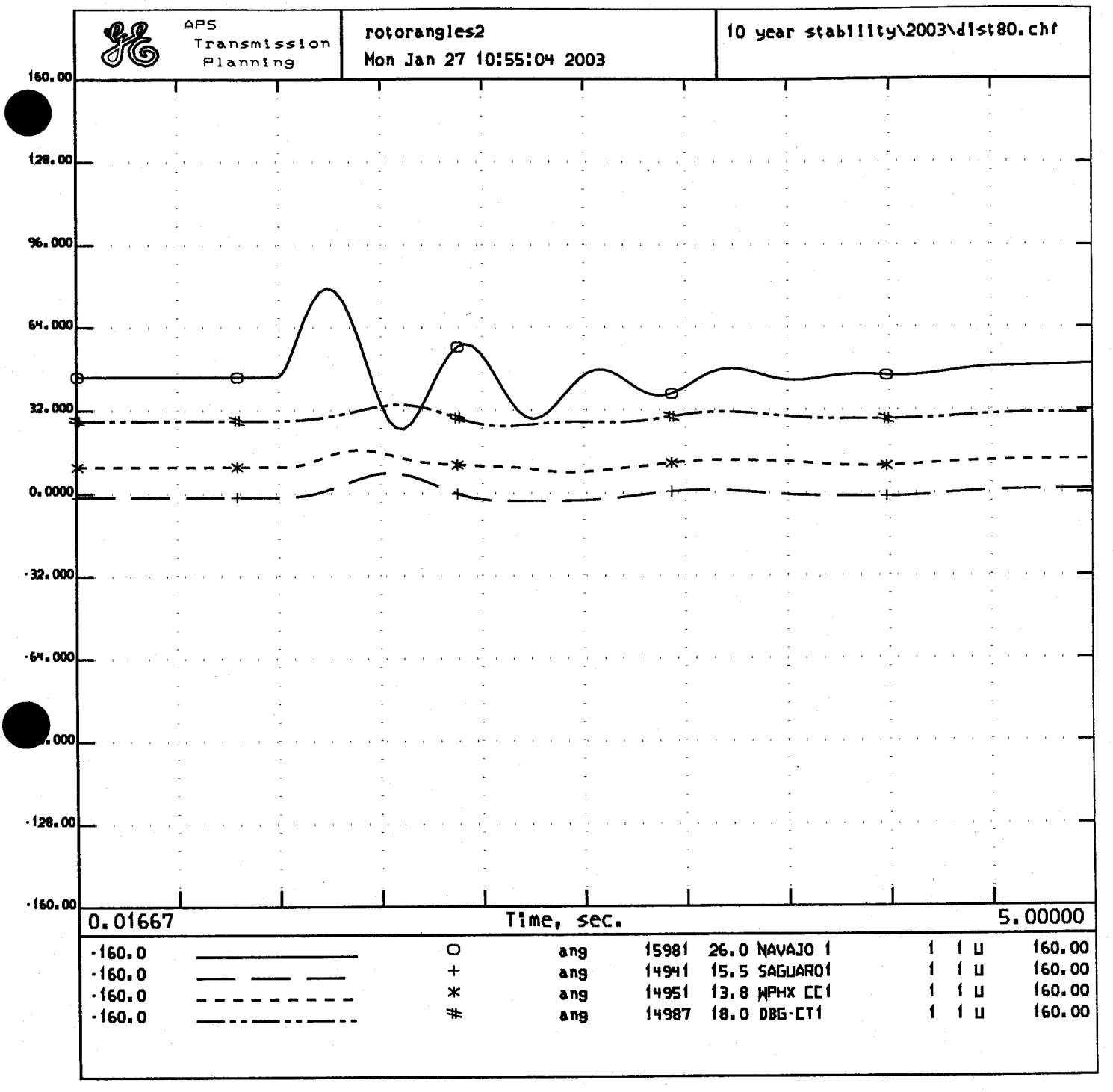
WESTERN SYSTEMS COORDINATING COUNCIL
NAV. FLT. Nav-Crystal line out
OCTOBER 29, 2001
NAV-CRYS STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-CRYS;8C REIN;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



WESTERN SYSTEMS COORDINATING COUNCIL
NAV. FLT. Nav-Crystal line out
OCTOBER 29, 2001
NAV-CRYS STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-CRYS;8C REIN;2003.dyd;WSCC.bat

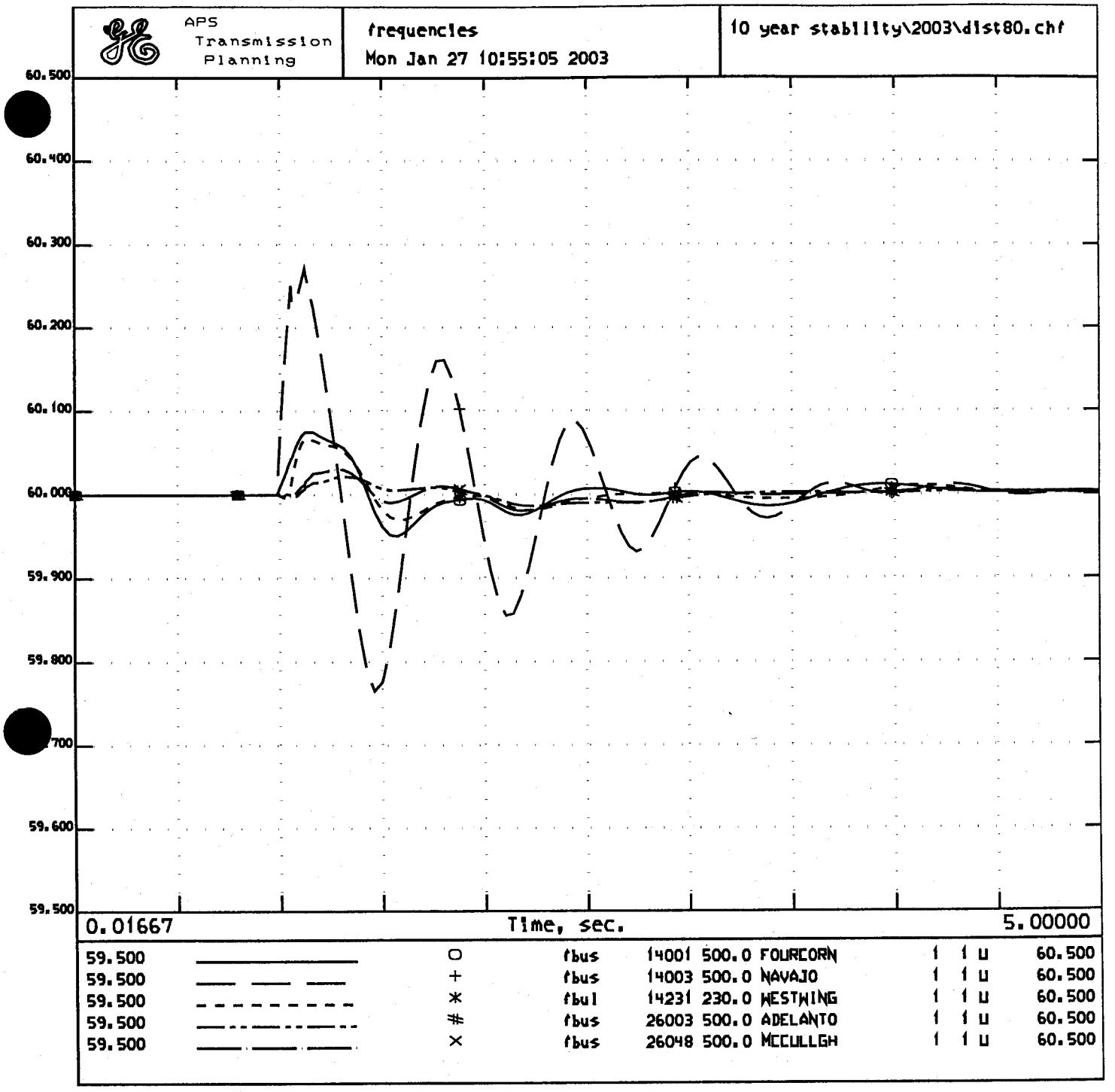
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



WESTERN SYSTEMS COORDINATING COUNCIL
NAV. FLT. Nav-Crystal line out
OCTOBER 29, 2001
NAV-CRYS STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-CRYS;8C REIN;2003.dyd;WSCC.bat

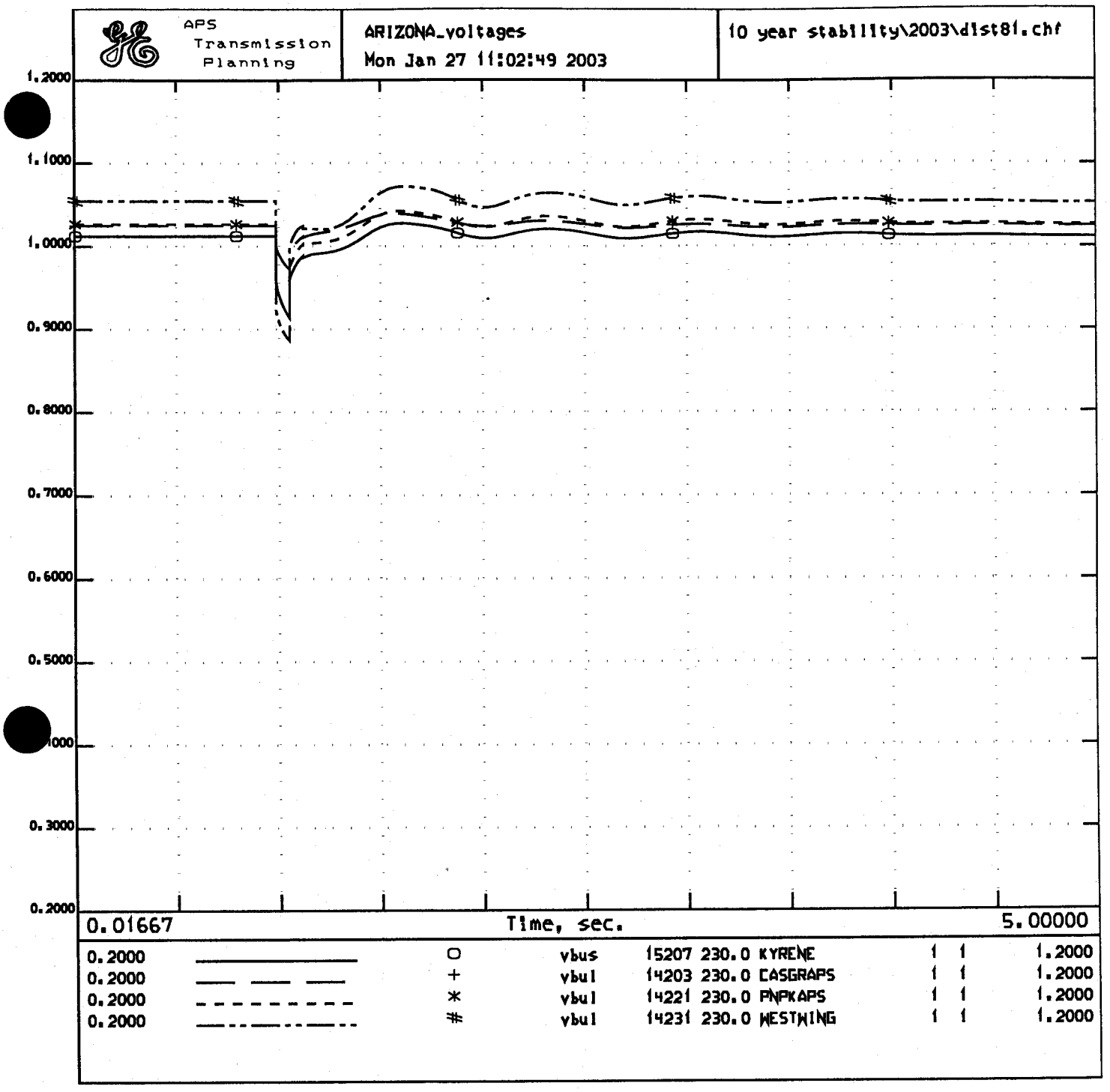
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

B64



WESTERN SYSTEMS COORDINATING COUNCIL
NAV. FLT. Nav-Crystal line out
OCTOBER 29, 2001
NAV-CRYS STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-CRYS;8C REIN;2003.dyd;WSCC.bat

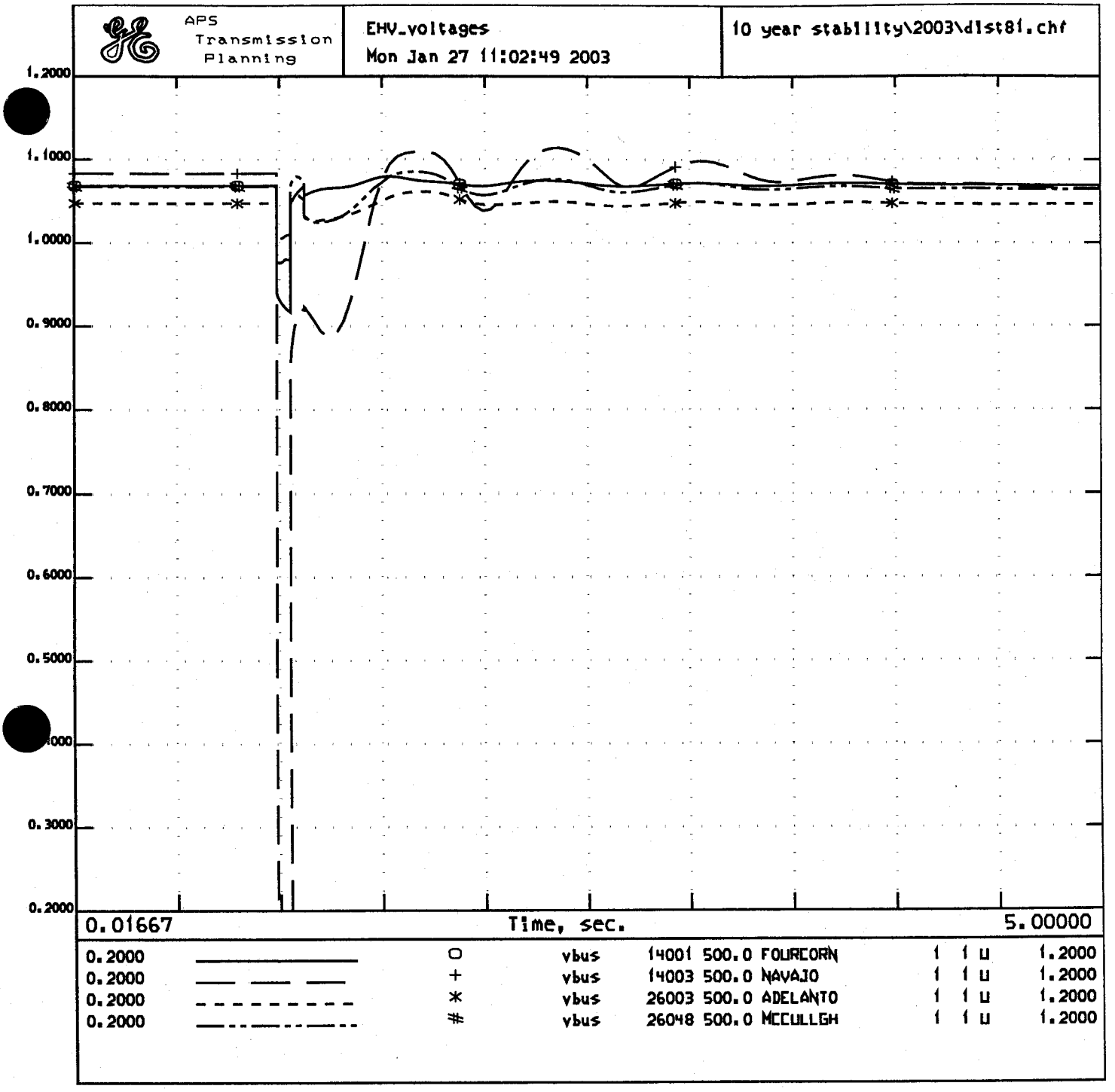
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



WESTERN SYSTEMS COORDINATING COUNCIL
NAV. FLT. Navjo-Mnk. line out
OCTOBER 29, 2001
NAV-MKP STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-MKP;8C REIN;2003.dyd;WSCC.bat

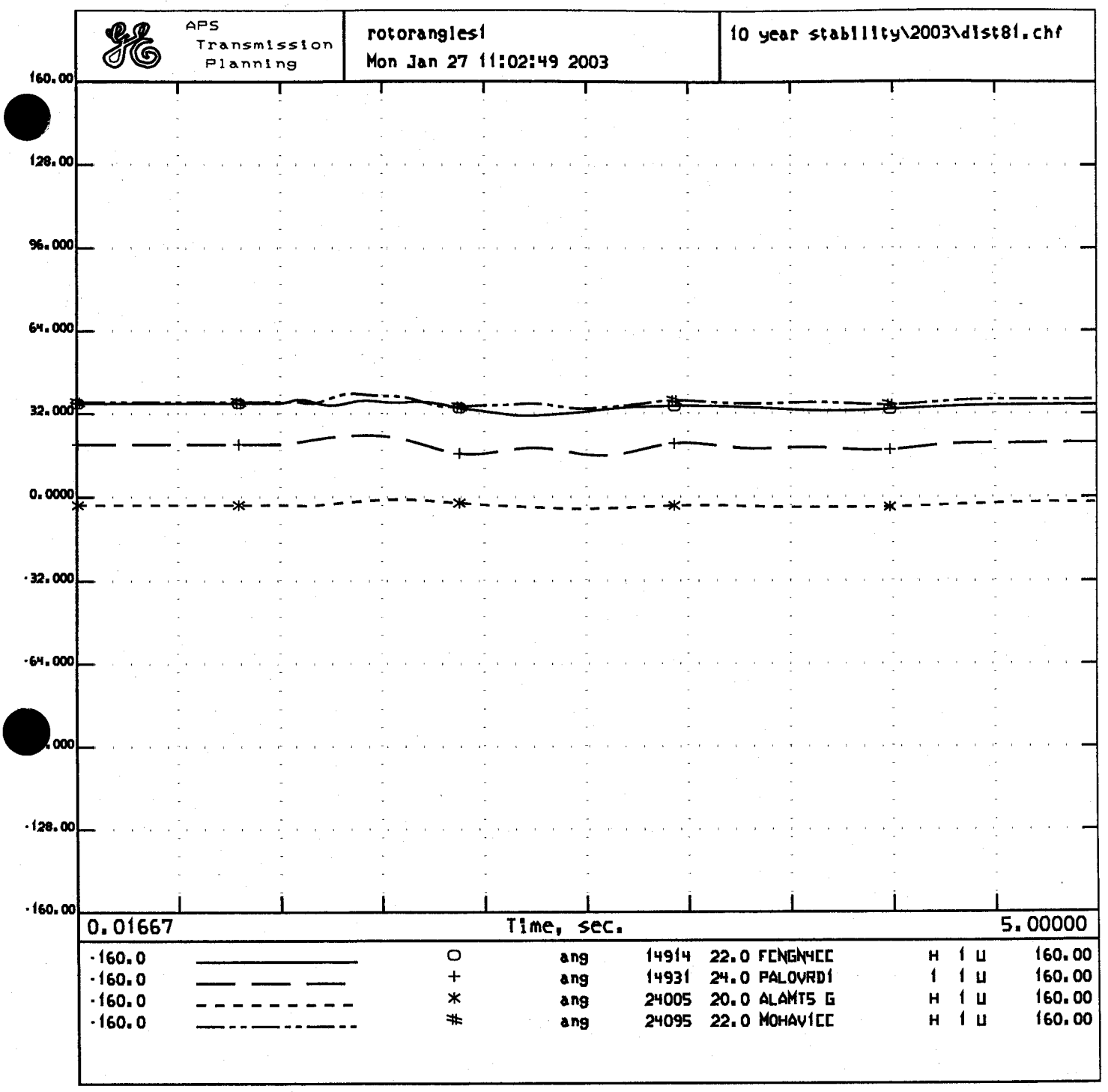
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

B66



WESTERN SYSTEMS COORDINATING COUNCIL
NAV. FLT. Navjo-Mnk. line out
OCTOBER 29, 2001
NAV-MKP STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-MKP;8C REIN;2003.dyd;WSCC.bat

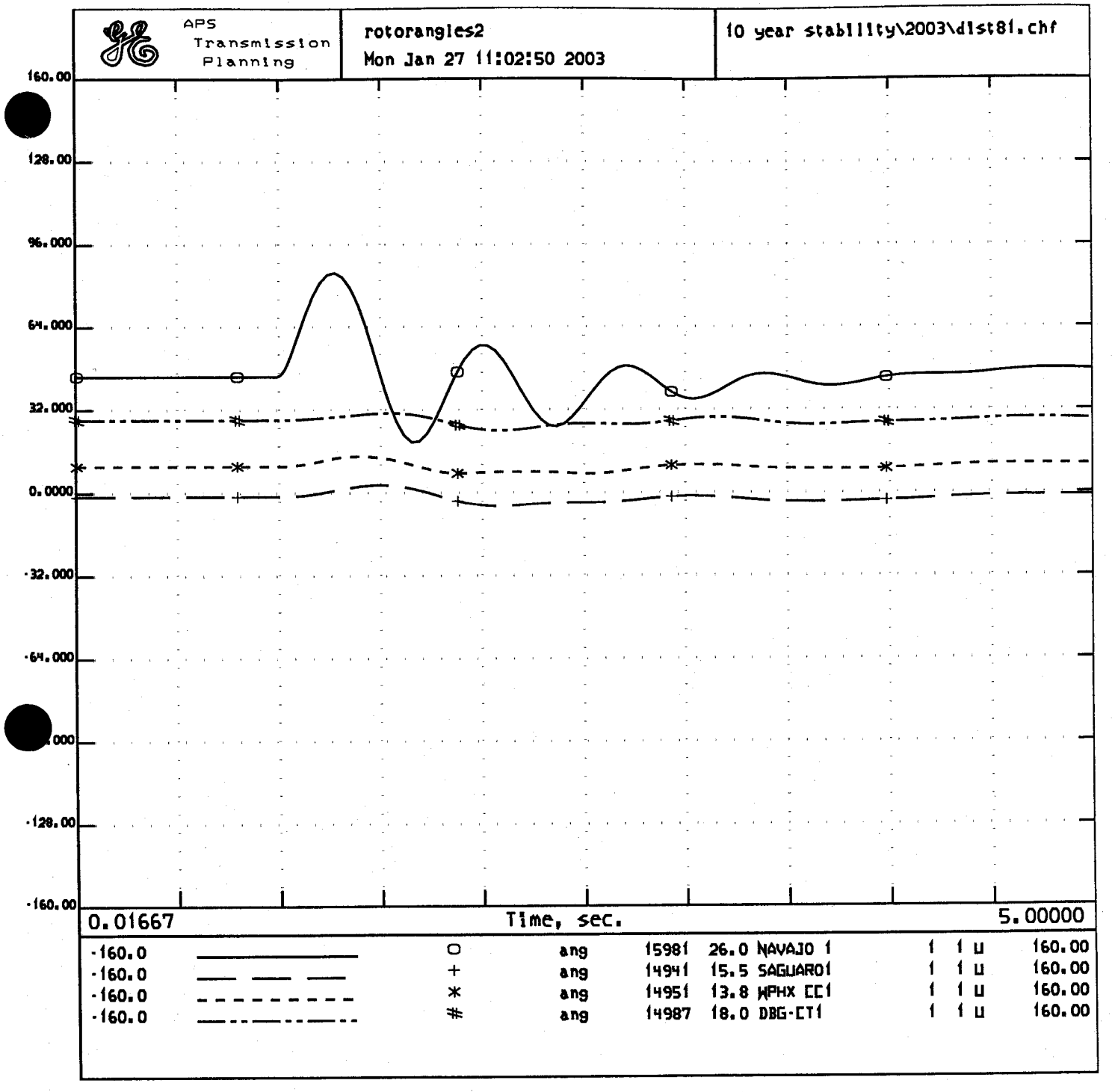
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



WESTERN SYSTEMS COORDINATING COUNCIL
NAV. FLT. Navjo-Mnk. line out
OCTOBER 29, 2001
NAV-MKP STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-MKP;8C REIN;2003.dyd;WSCC.bat

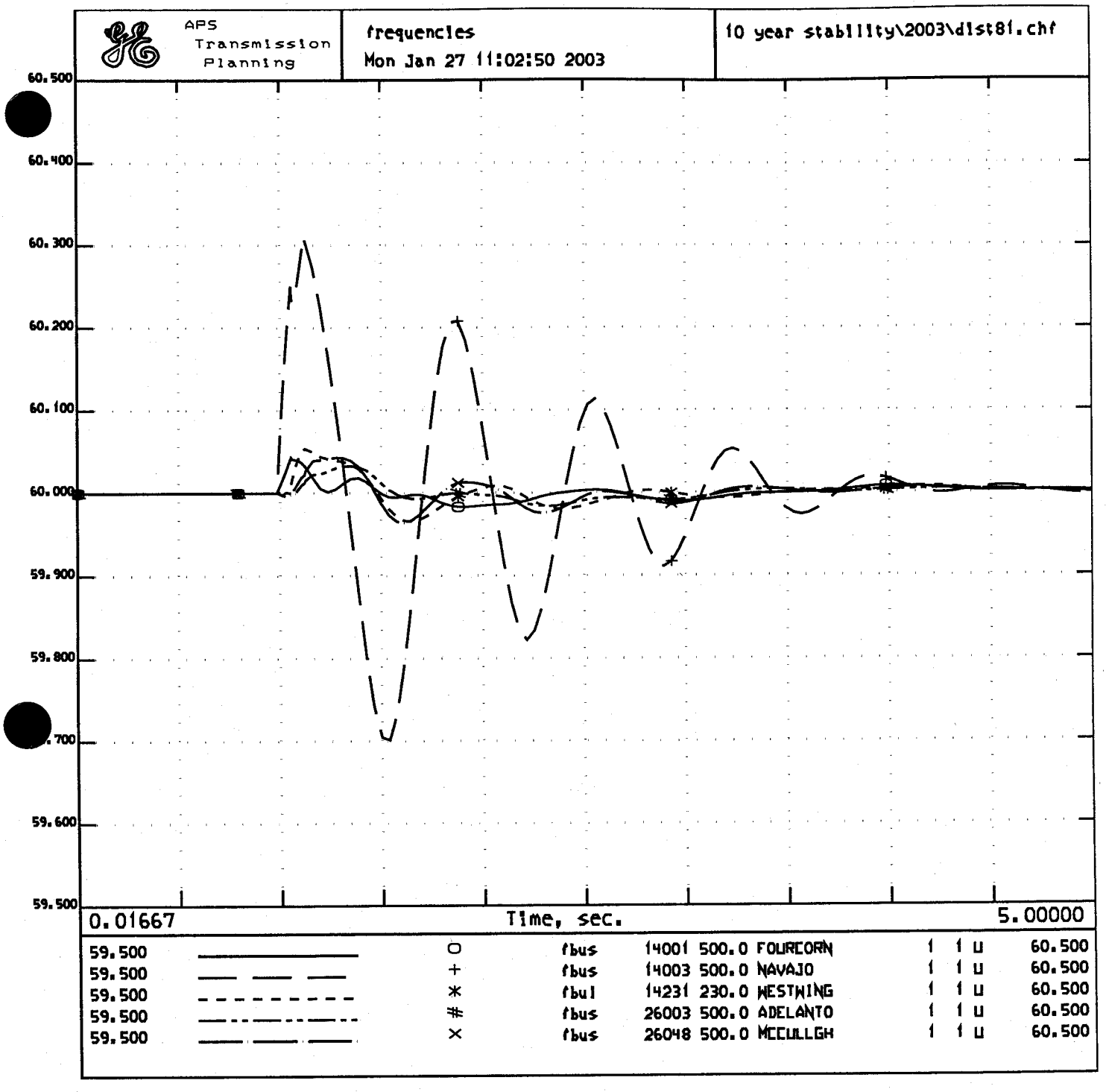
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

B68



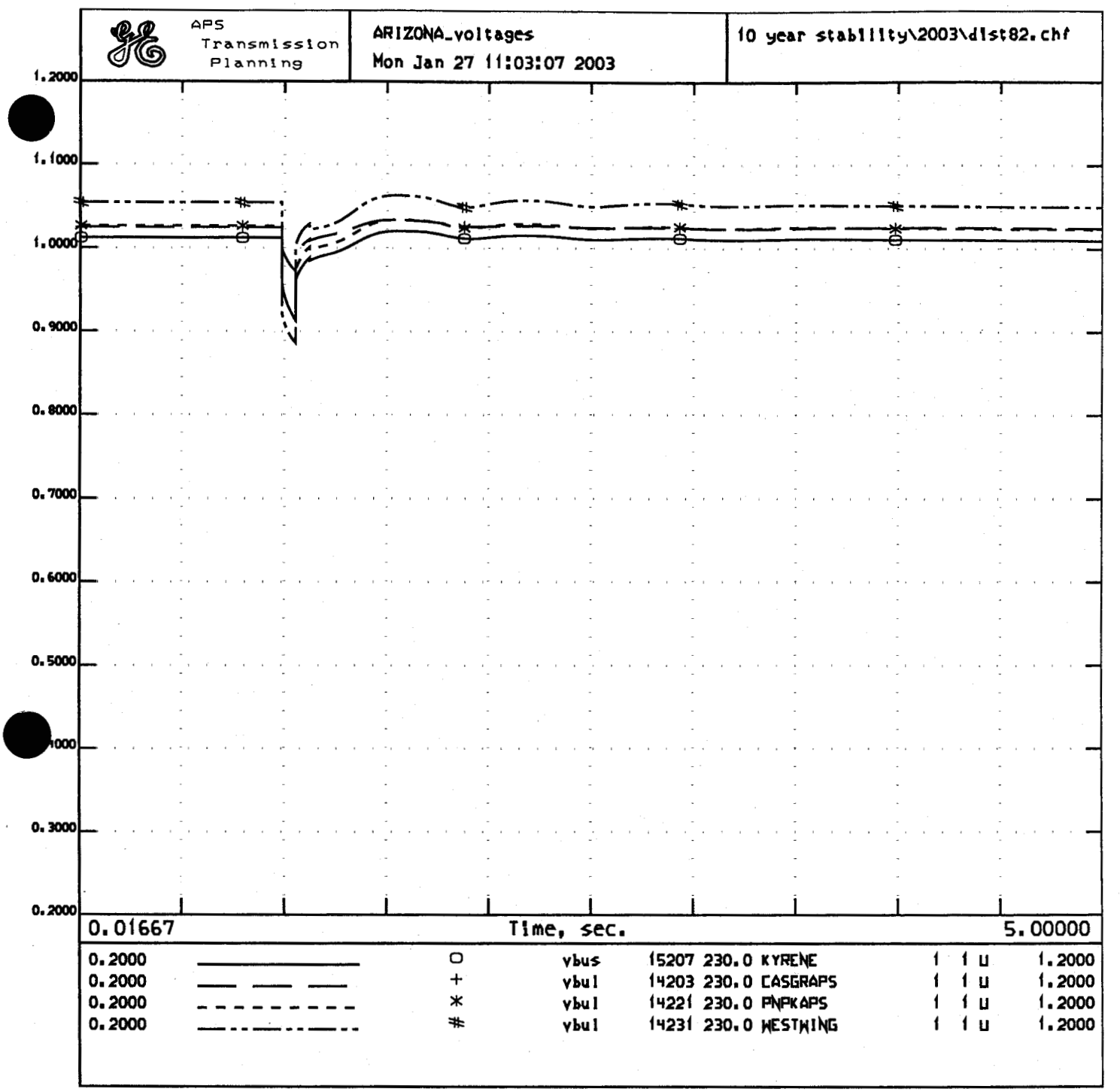
WESTERN SYSTEMS COORDINATING COUNCIL
NAV. FLT. Navjo-Mnk. line out
OCTOBER 29, 2001
NAV-MKP STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-MKP;8C REIN;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



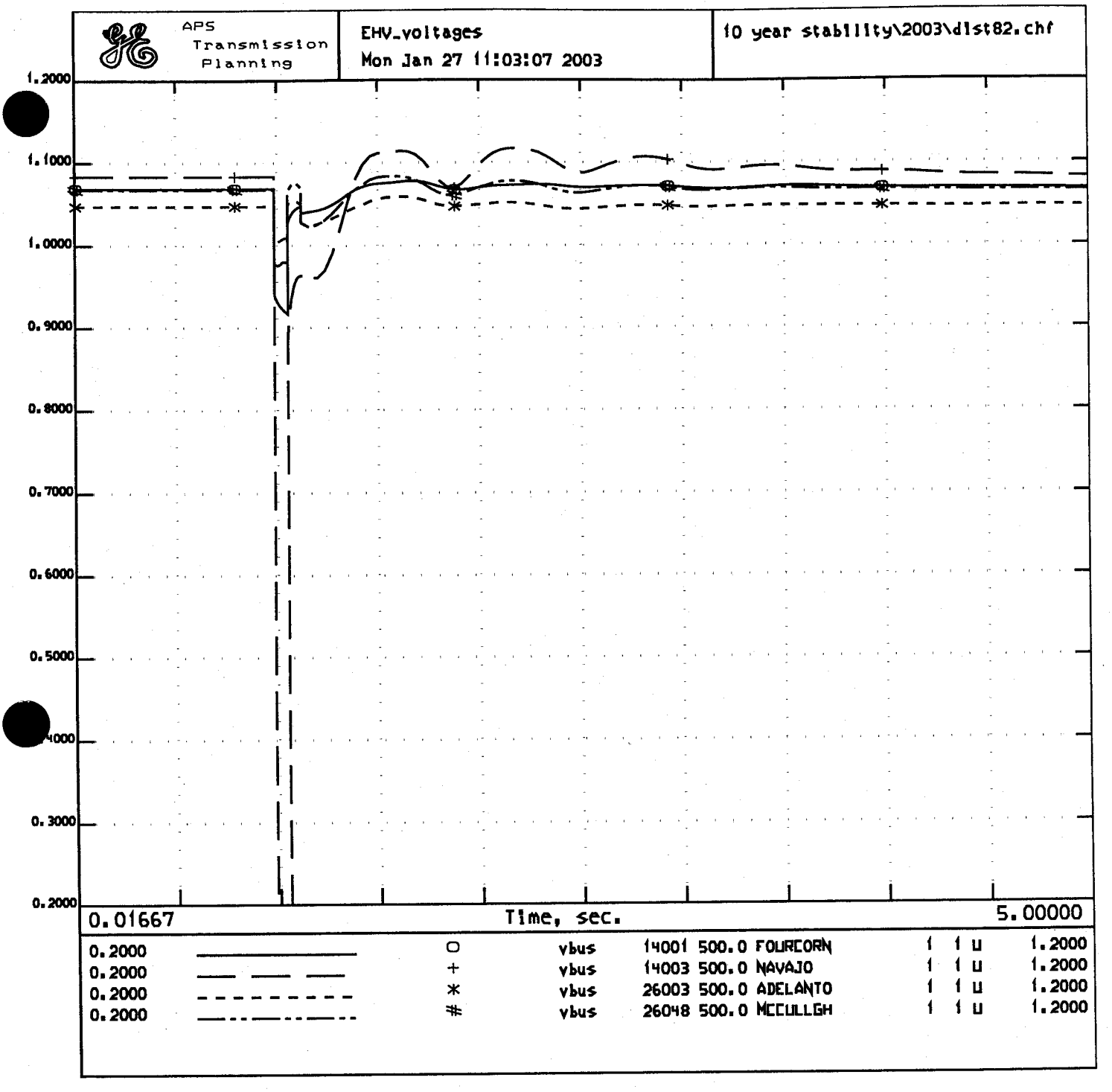
WESTERN SYSTEMS COORDINATING COUNCIL
NAV. FLT. Navjo-Mnk. line out
OCTOBER 29, 2001
NAV-MKP STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-MKP;8C REIN;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



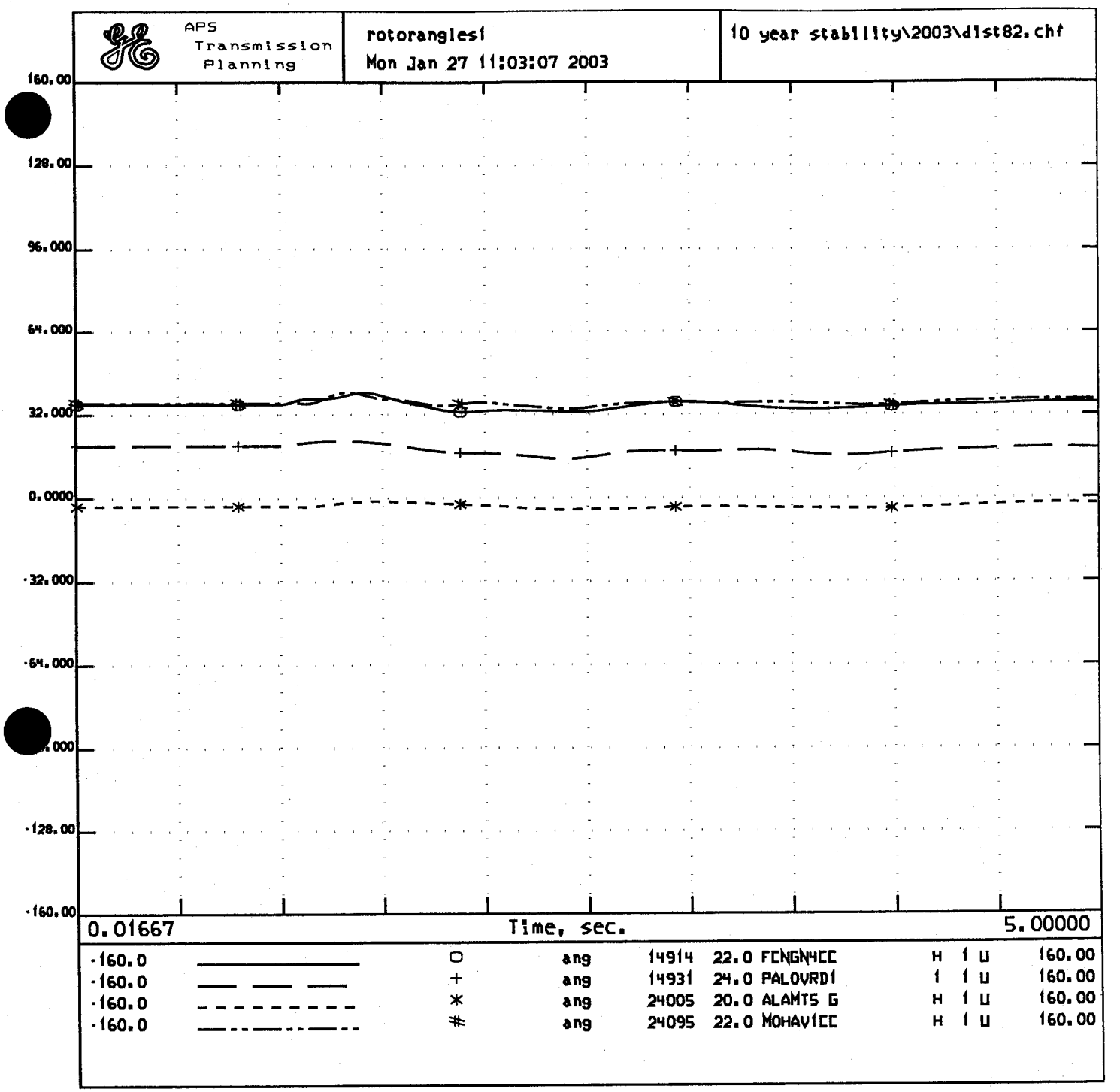
NAV FLT NAV-WW LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
NAV-WWG STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-WWG;8C REIN;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



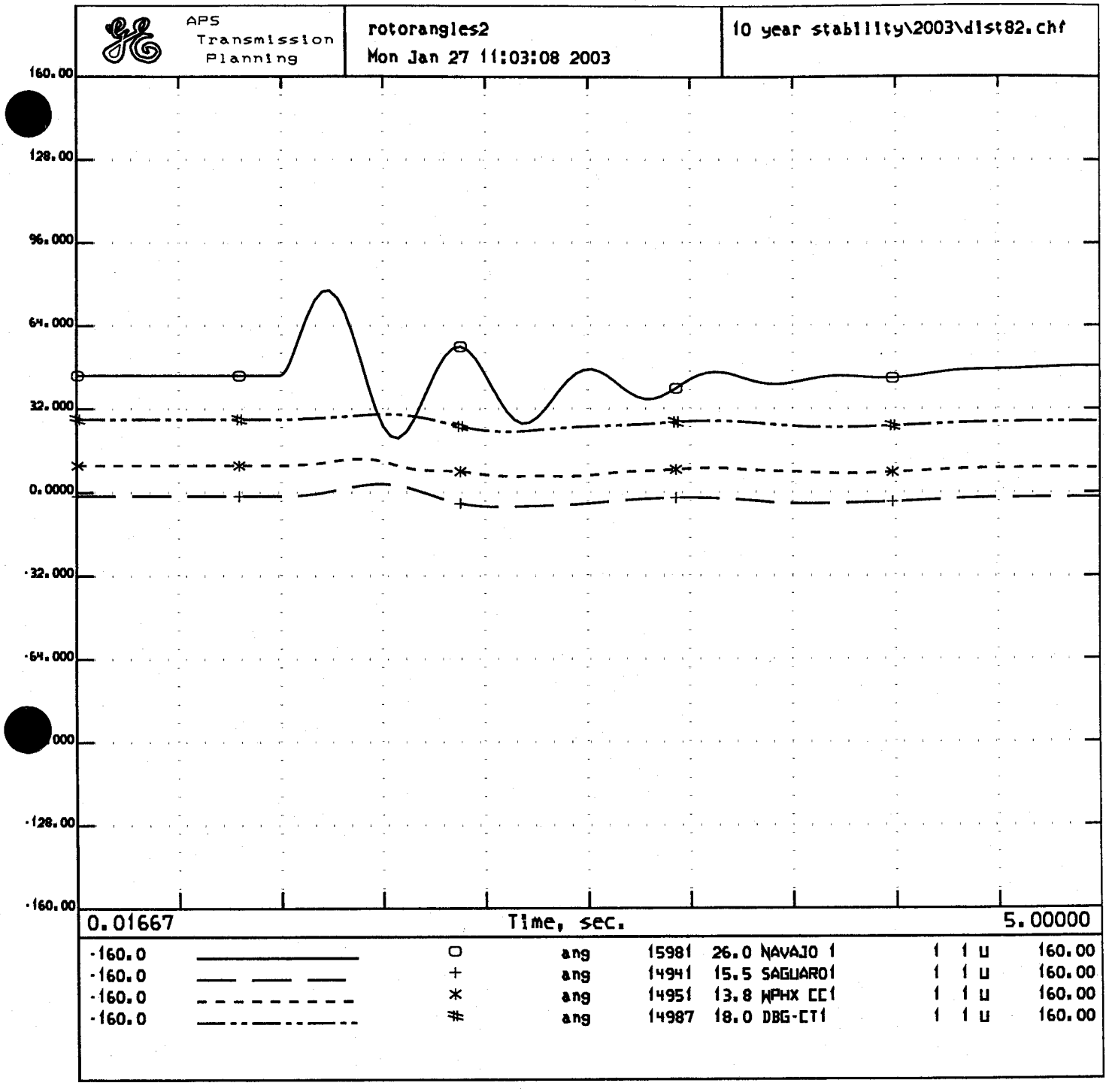
NAV FLT NAV-WW LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
NAV-WWG STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-WWG;8C REIN;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



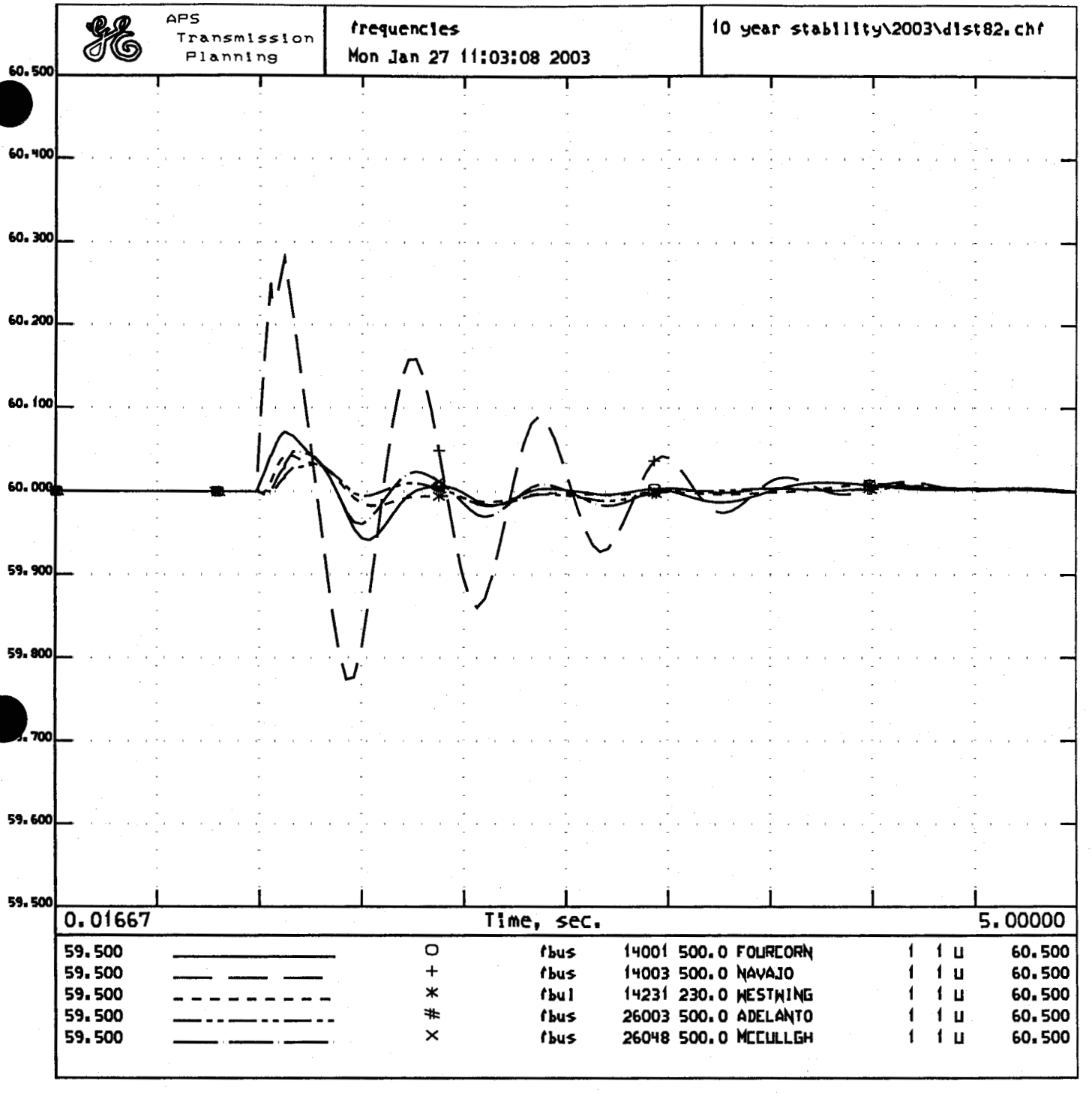
NAV FLT NAV-WW LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
NAV-WWG STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-WWG;8C REIN;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



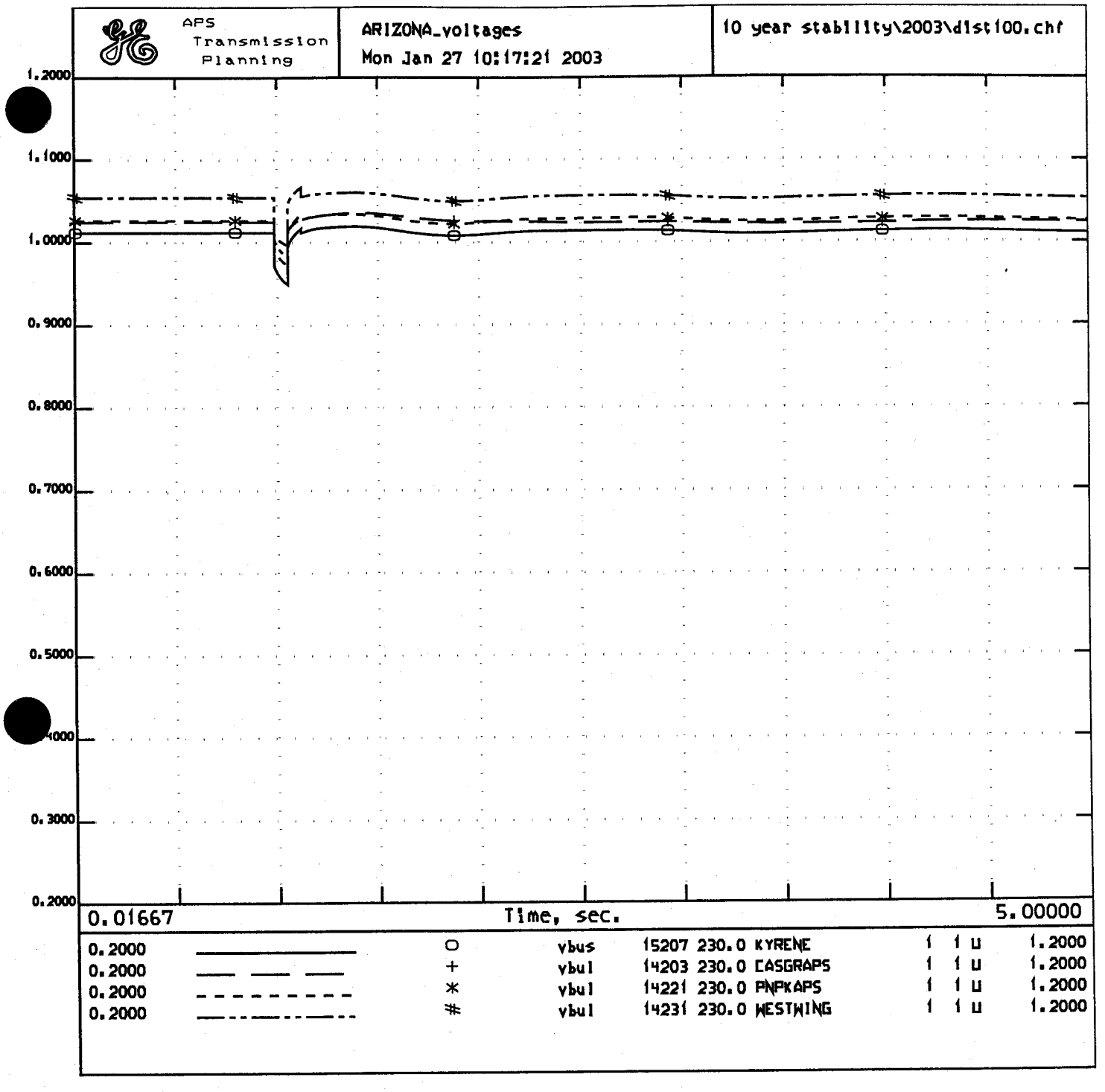
NAV FLT NAV-WW LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
NAV-WWG STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-WWG;8C REIN;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



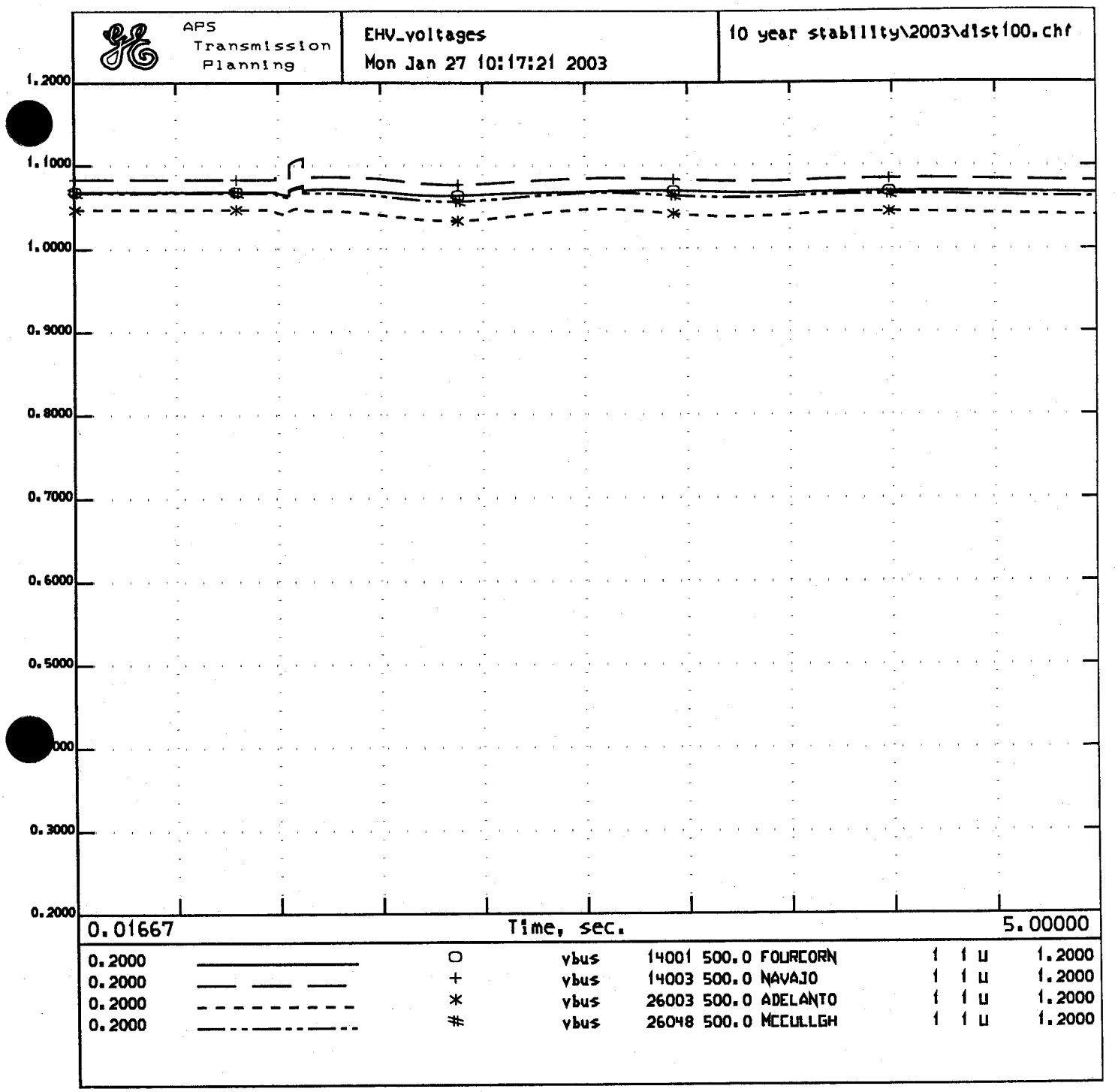
NAV FLT NAV-WW LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
NAV-WWG STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-WWG;8C REIN;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



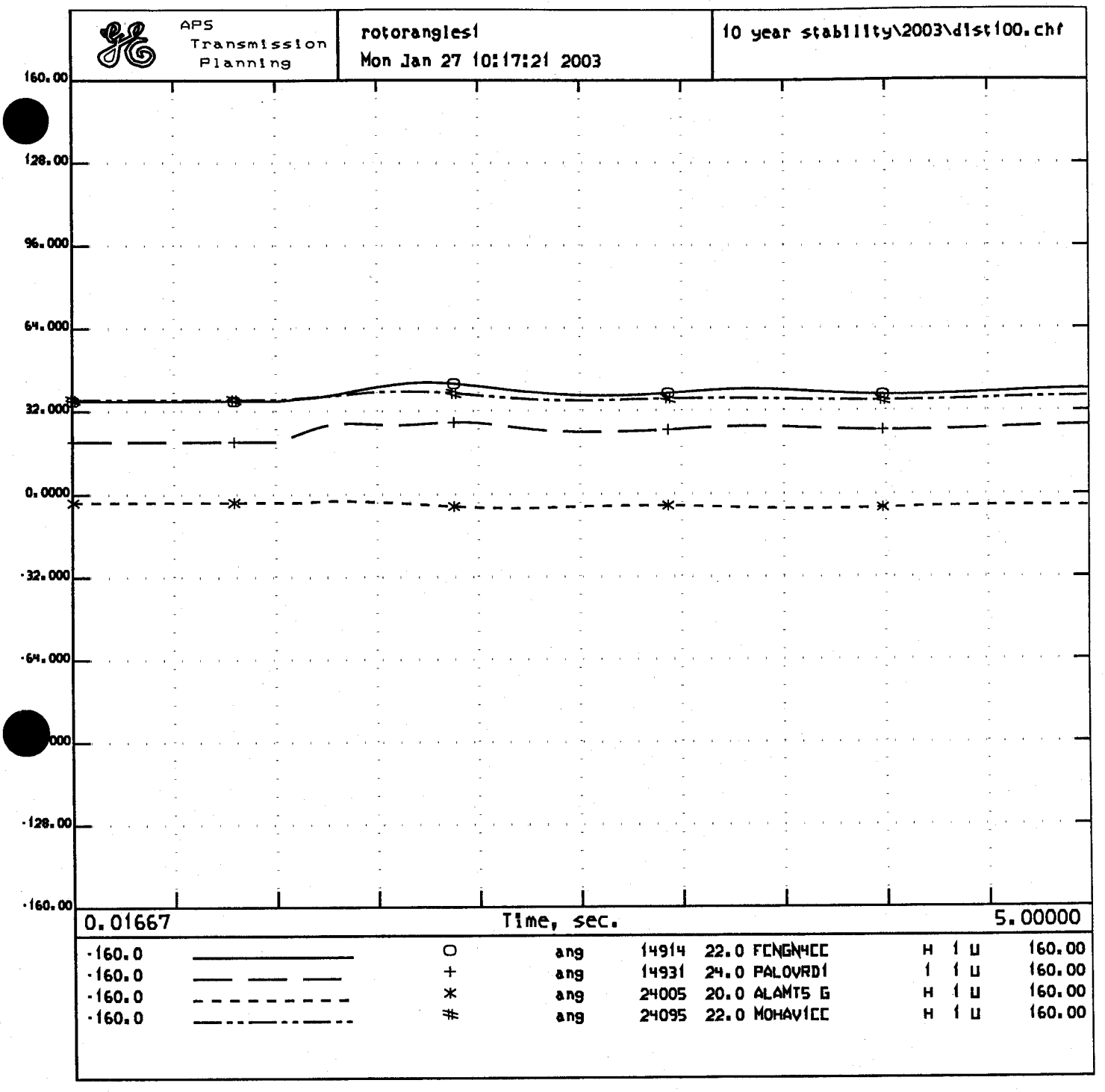
N.GILA FLT HASSY-N.GILA LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
N.GILA STAB,3 PH FLT N.GILA 500KV
FLASH CAPS,W/4 CYC CLR FLT;HASSAYMPA-NG OUT;4/8 CYC REIN CAPS

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



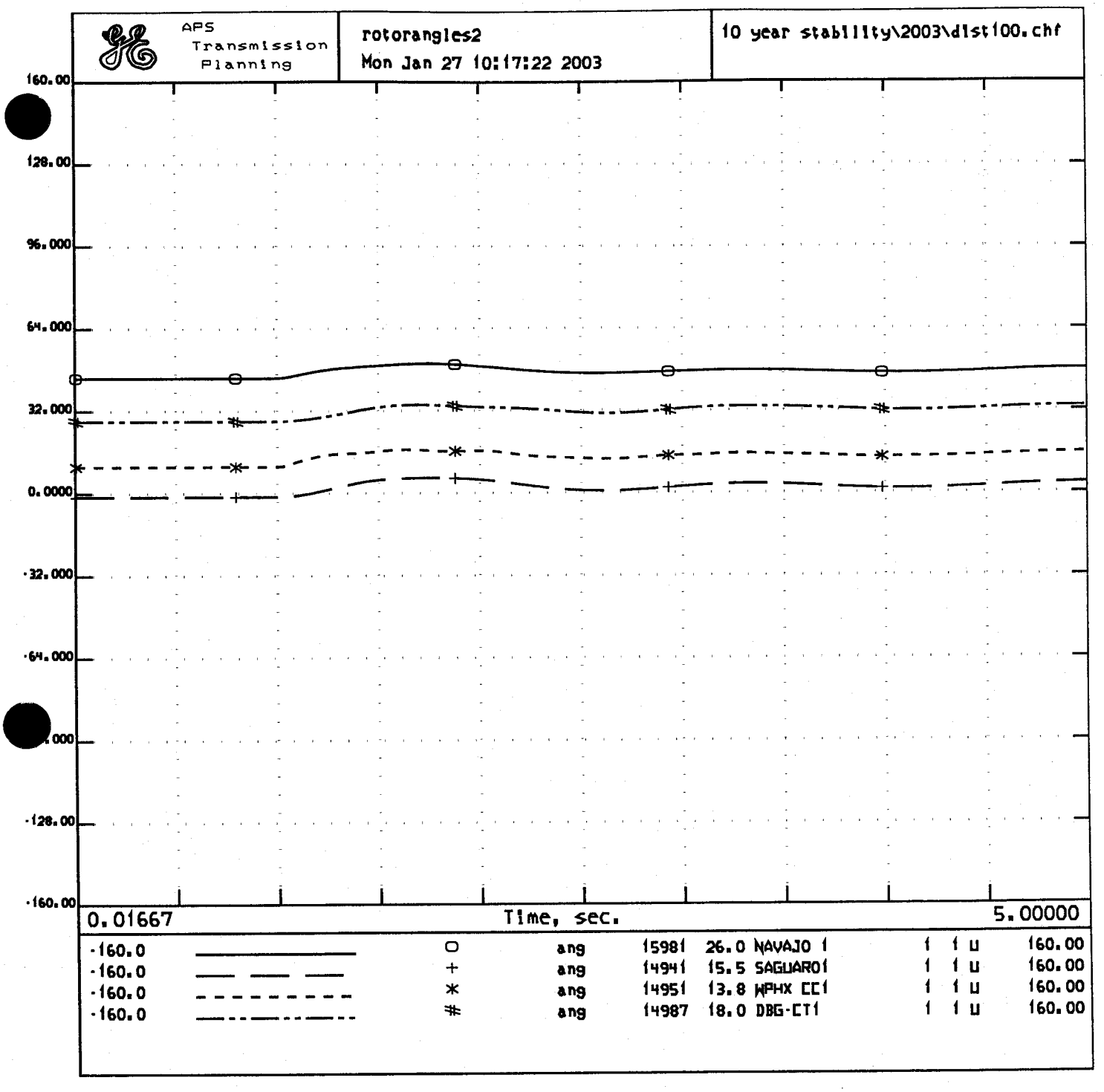
N.GILA FLT HASSY-N.GILA LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
N.GILA STAB,3 PH FLT N.GILA 500KV
FLASH CAPS,W/4 CYC CLR FLT;HASSAYMPA-NG OUT;4/8 CYC REIN CAPS

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



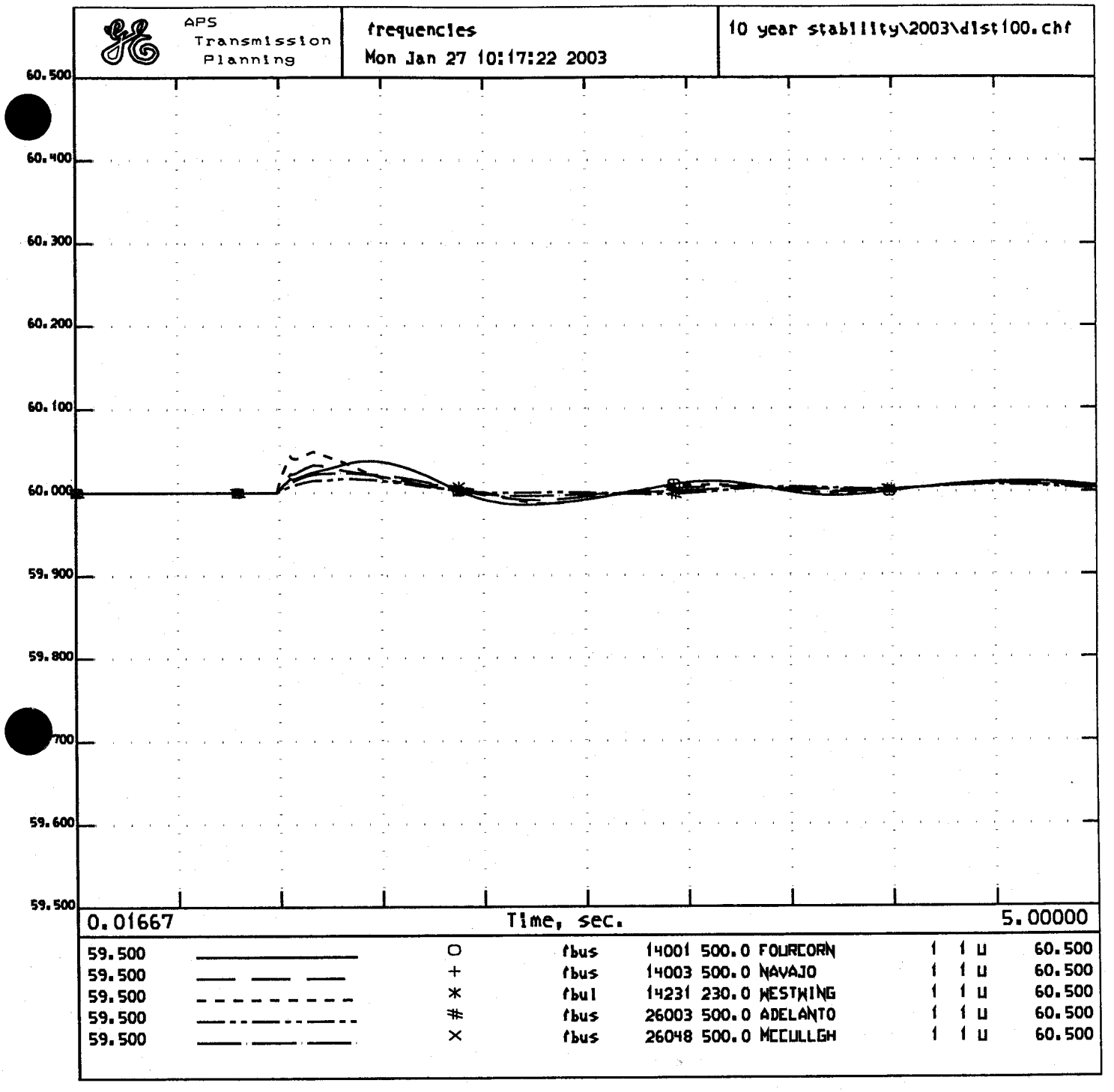
N.GILA FLT HASSY-N.GILA LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
N.GILA STAB,3 PH FLT N.GILA 500KV
FLASH CAPS,W/4 CYC CLR FLT;HASSAYMPA-NG OUT;4/8 CYC REIN CAPS

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



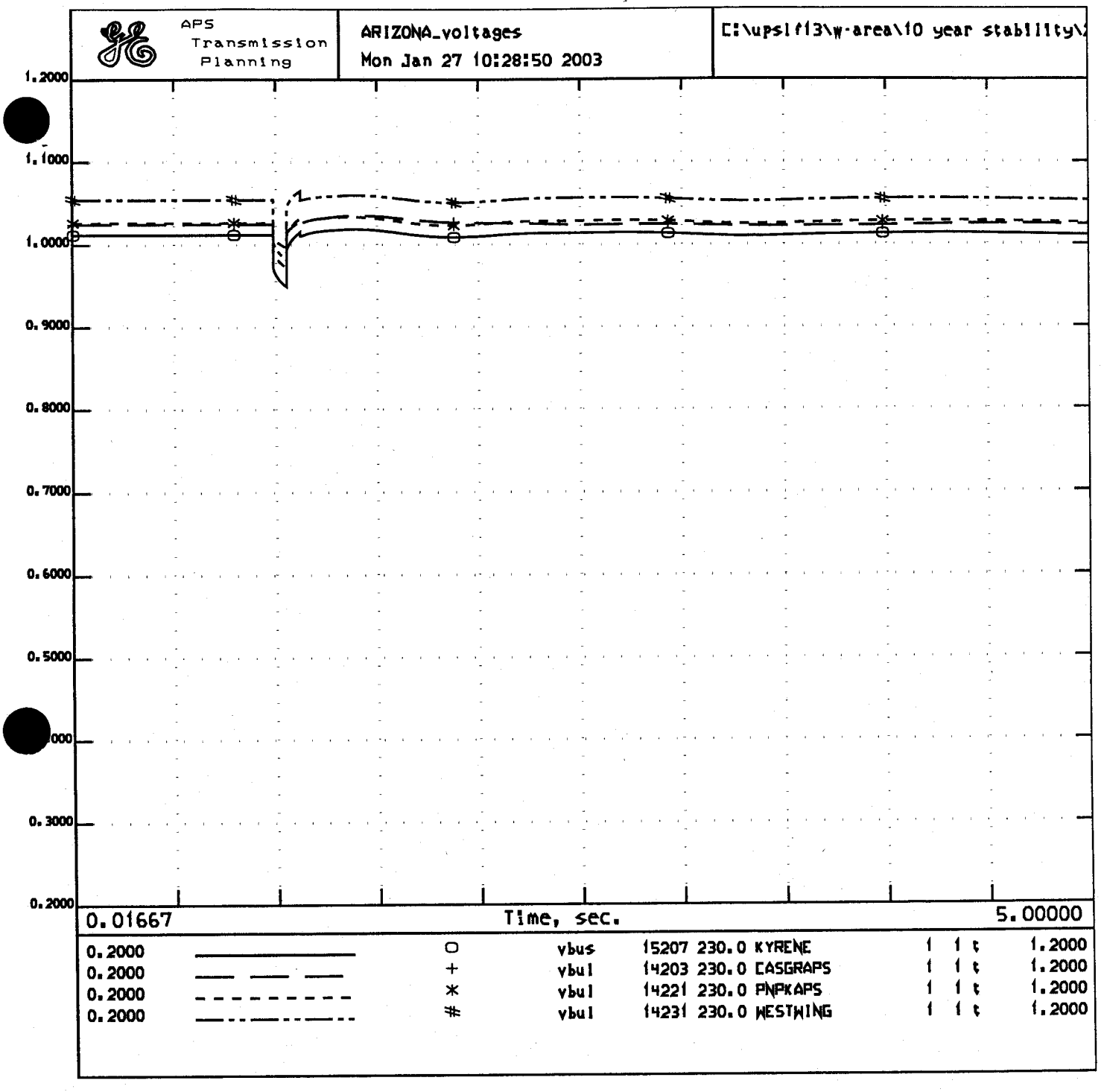
N.GILA FLT HASSY-N.GILA LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
N.GILA STAB,3 PH FLT N.GILA 500KV
FLASH CAPS,W/4 CYC CLR FLT;HASSAYMPA-NG OUT;4/8 CYC REIN CAPS

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



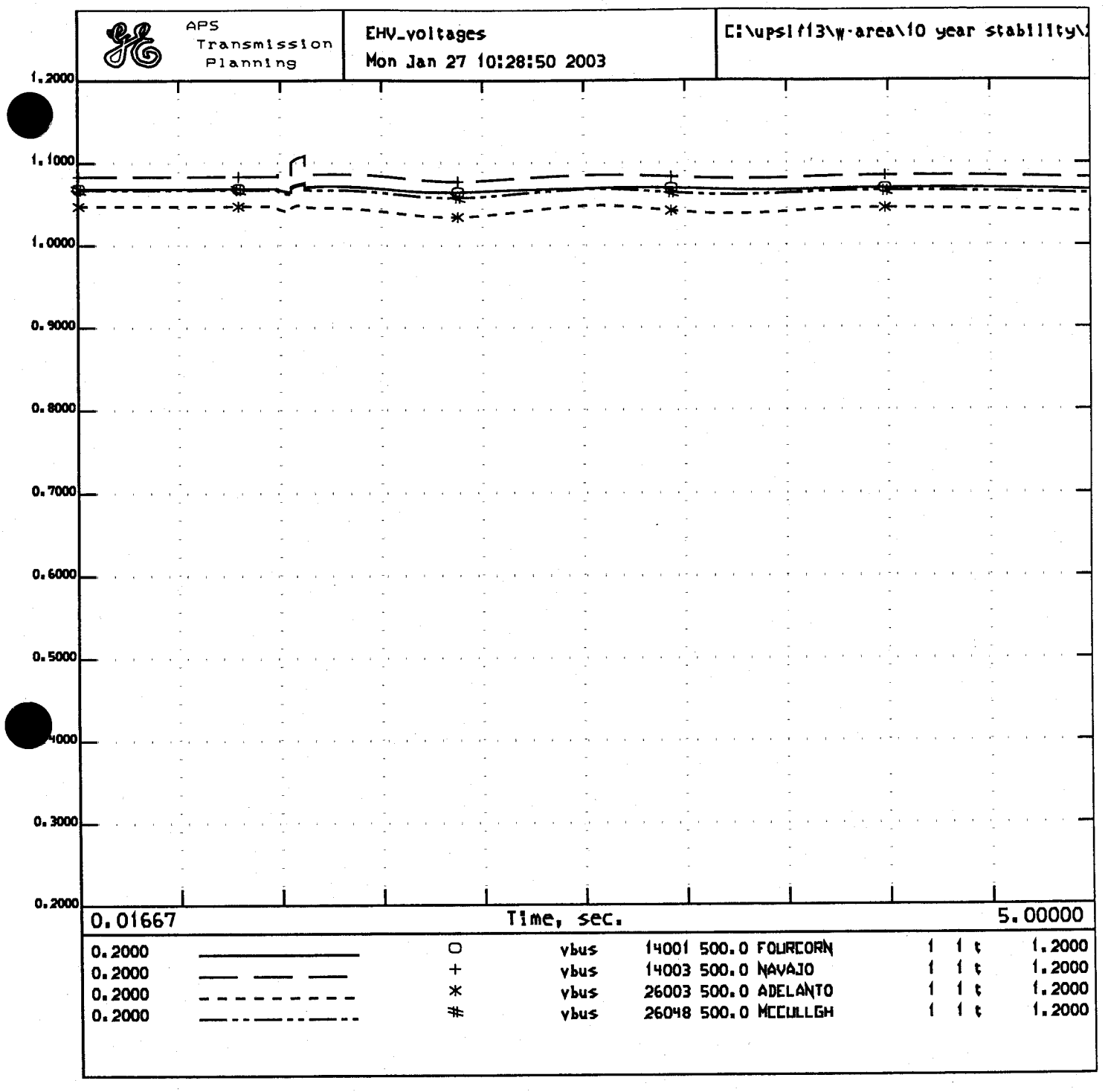
N.GILA FLT HASSY-N.GILA LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
N.GILA STAB,3 PH FLT N.GILA 500KV
FLASH CAPS,W/4 CYC CLR FLT;HASSAYMPA-NG OUT;4/8 CYC REIN CAPS

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



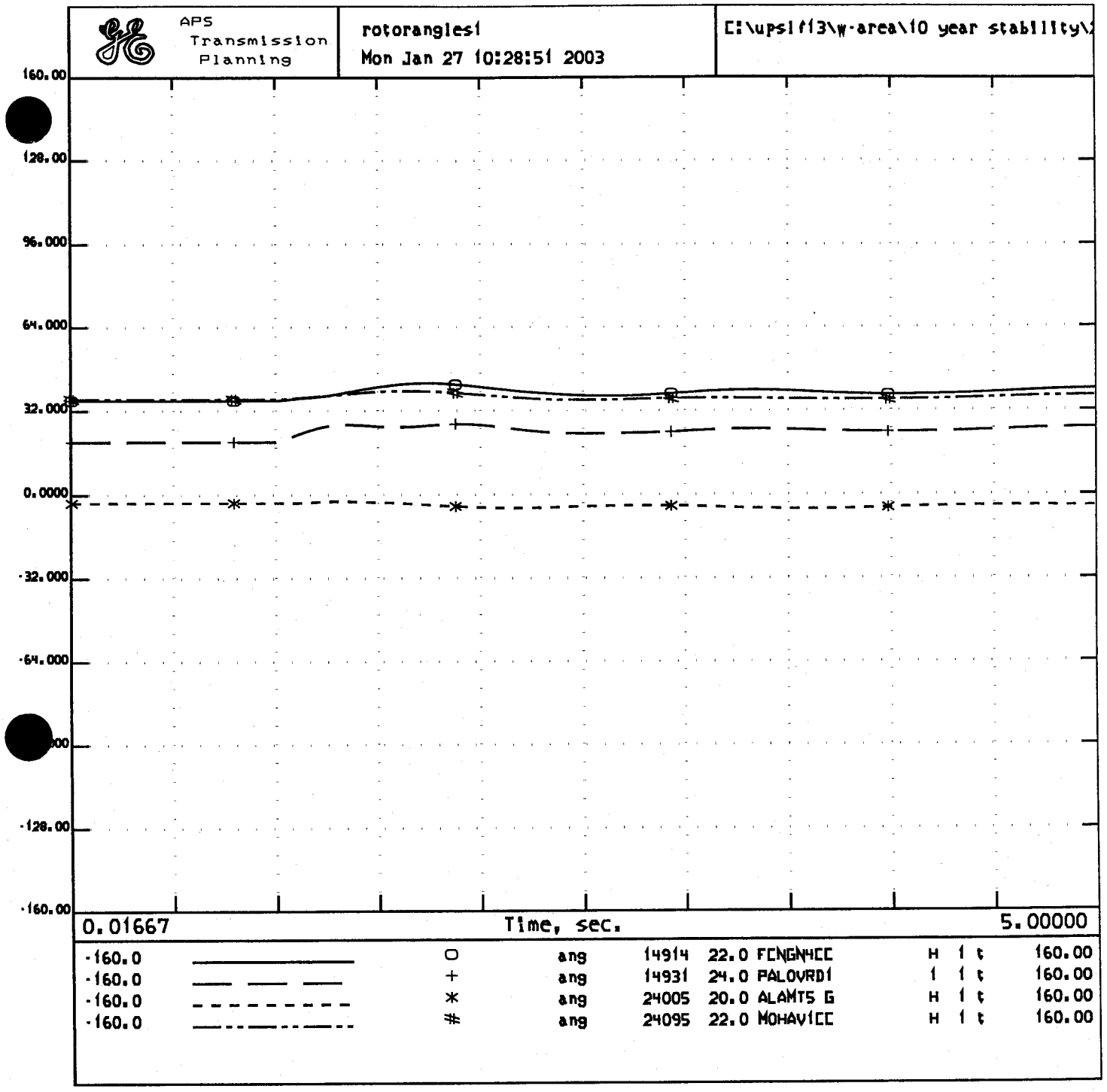
N.GILA FLT IMP. V-N.GILA LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
N.GILA STAB,3 PH FLT N.GILA 500KV
FLASH CAPS,W/4 CYC CLR FLT;IMPV-NG OUT;4/8 CYC REIN CAPS

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



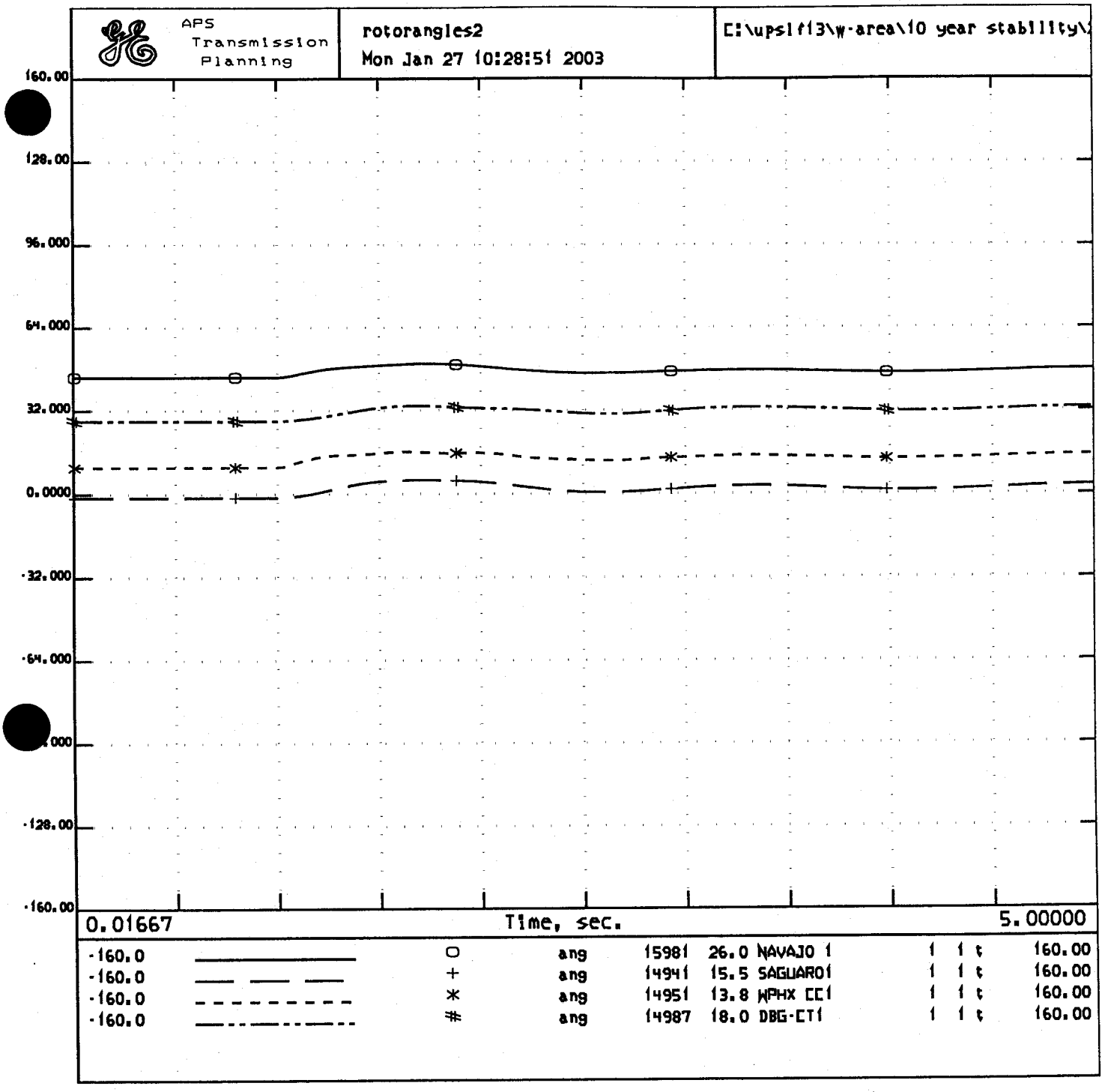
N.GILA FLT IMP. V-N.GILA LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
N.GILA STAB,3 PH FLT N.GILA 500KV
FLASH CAPS,W/4 CYC CLR FLT;IMPV-NG OUT;4/8 CYC REIN CAPS

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



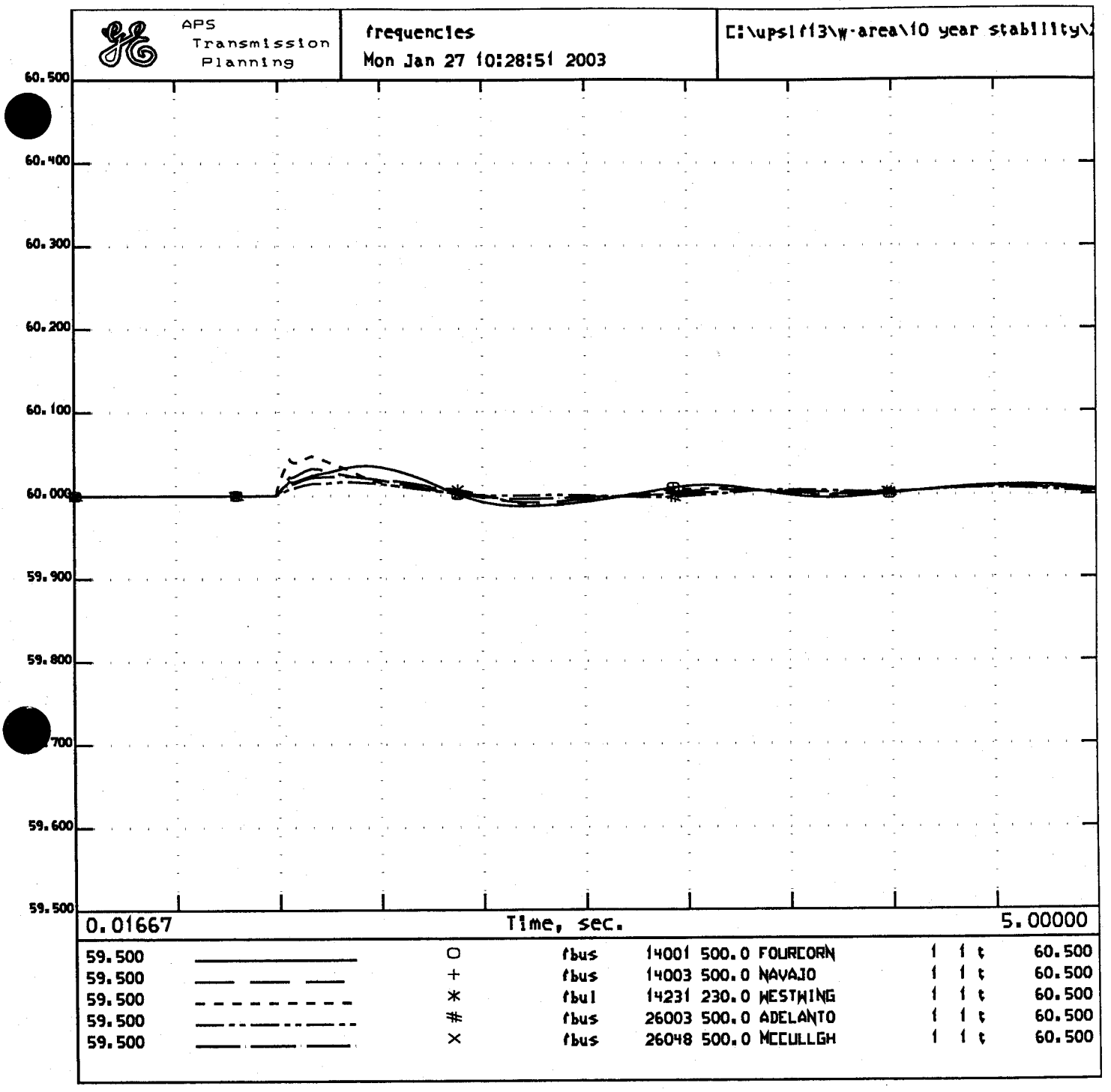
N.GILA FLT IMP. V-N.GILA LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
N.GILA STAB,3 PH FLT N.GILA 500KV
FLASH CAPS,W/4 CYC CLR FLT;IMPV-NG OUT;4/8 CYC REIN CAPS

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



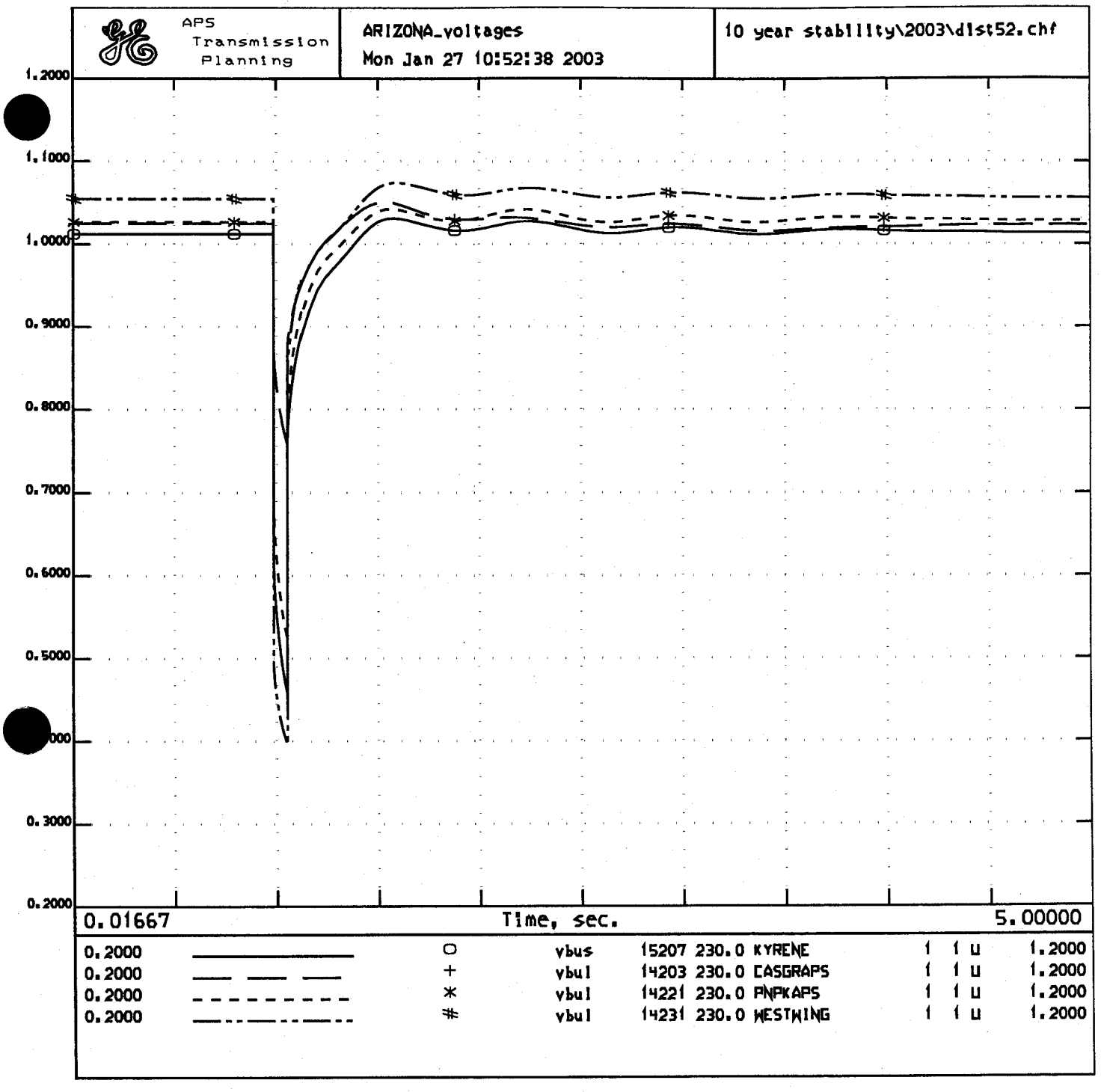
N.GILA FLT IMP. V-N.GILA LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
N.GILA STAB,3 PH FLT N.GILA 500KV
FLASH CAPS,W/4 CYC CLR FLT;IMPV-NG OUT;4/8 CYC REIN CAPS

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



N.GILA FLT IMP. V-N.GILA LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
N.GILA STAB,3 PH FLT N.GILA 500KV
FLASH CAPS,W/4 CYC CLR FLT;IMPV-NG OUT;4/8 CYC REIN CAPS

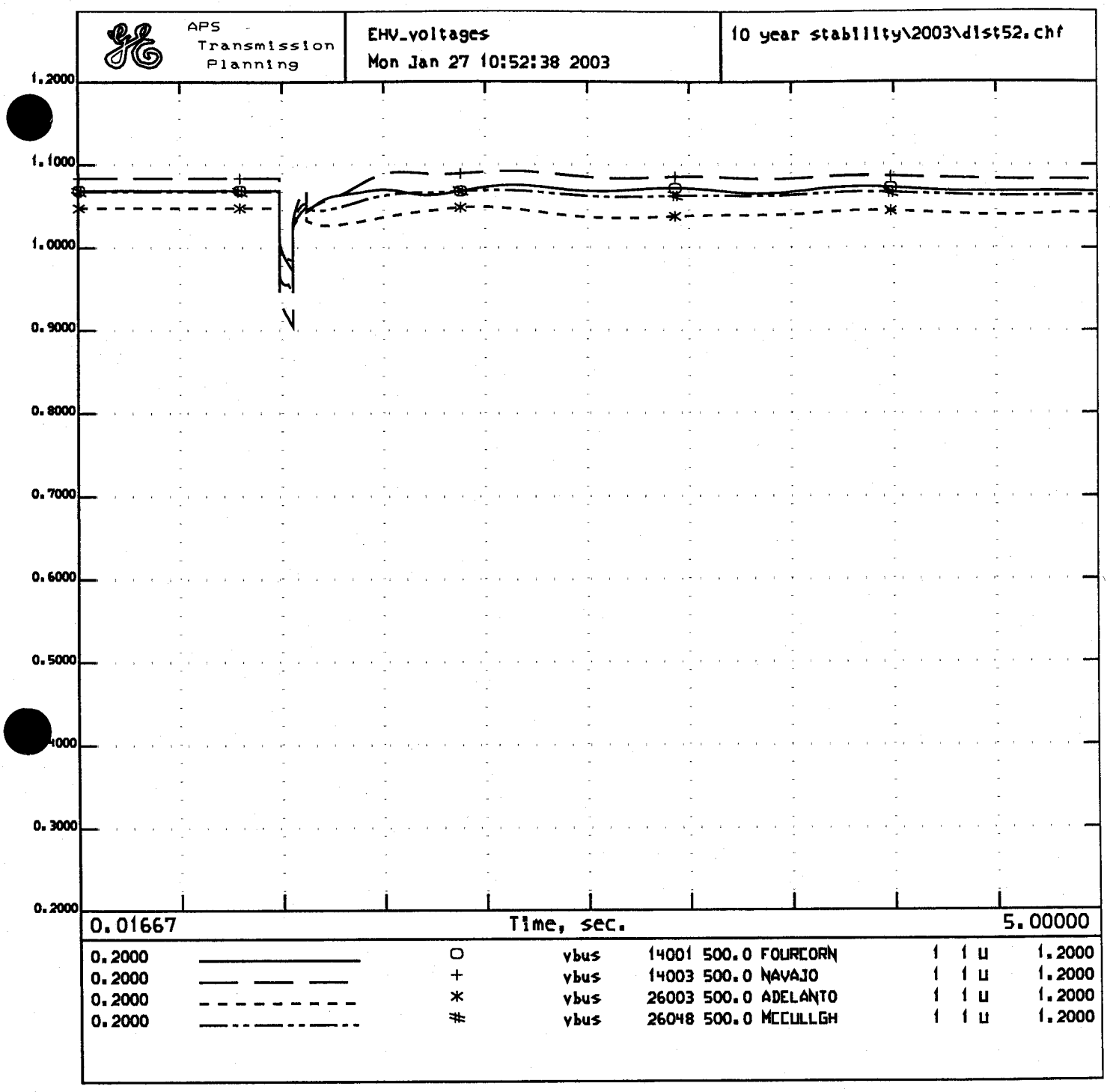
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



WESTERN SYSTEMS COORDINATING COUNCIL
PV FLT. w/PV - Devers line out
OCTOBER 29, 2001
PV-DEV STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-DEV8C REIN;2003.dyd;WSCC.bat

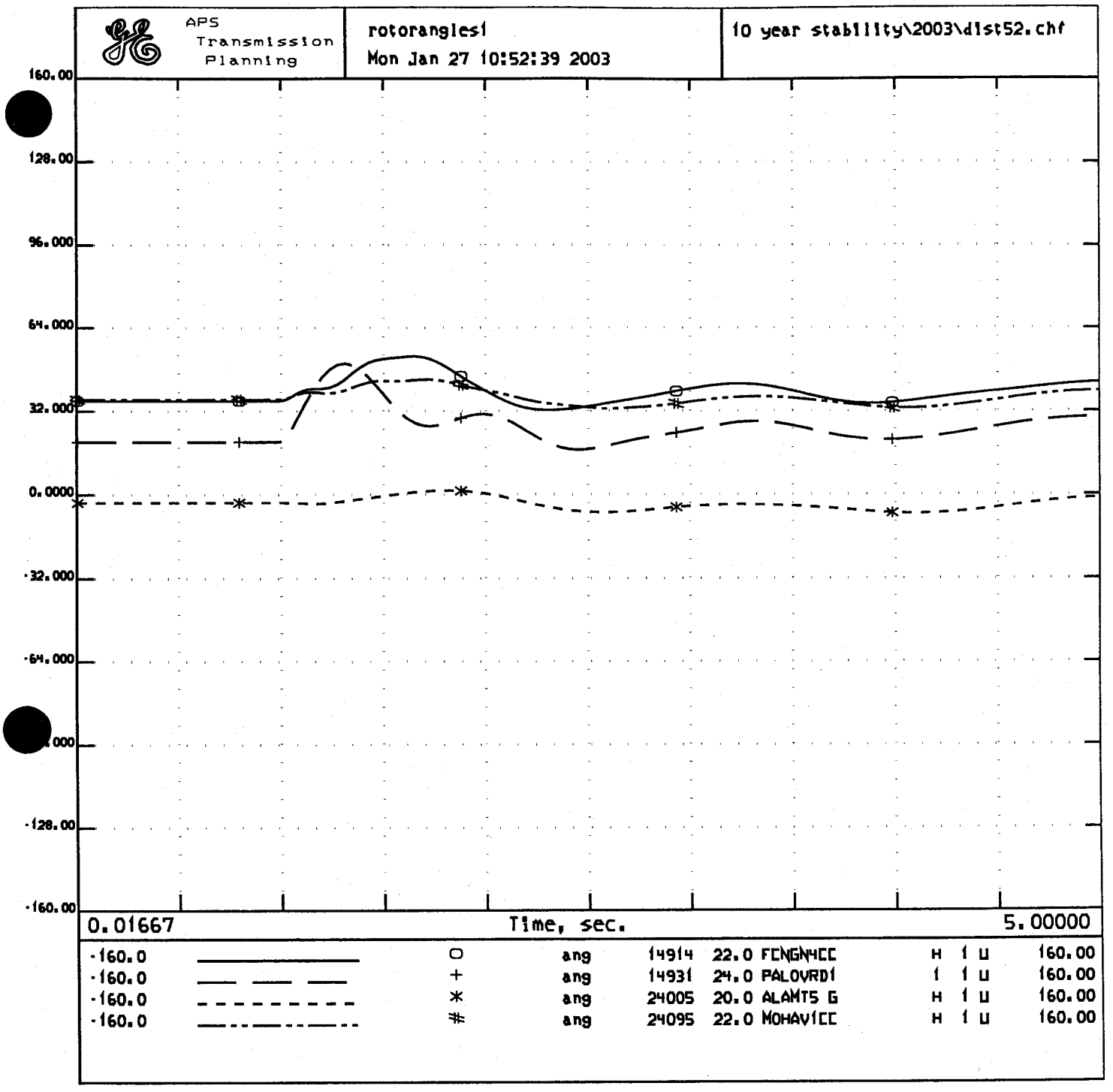
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

B86



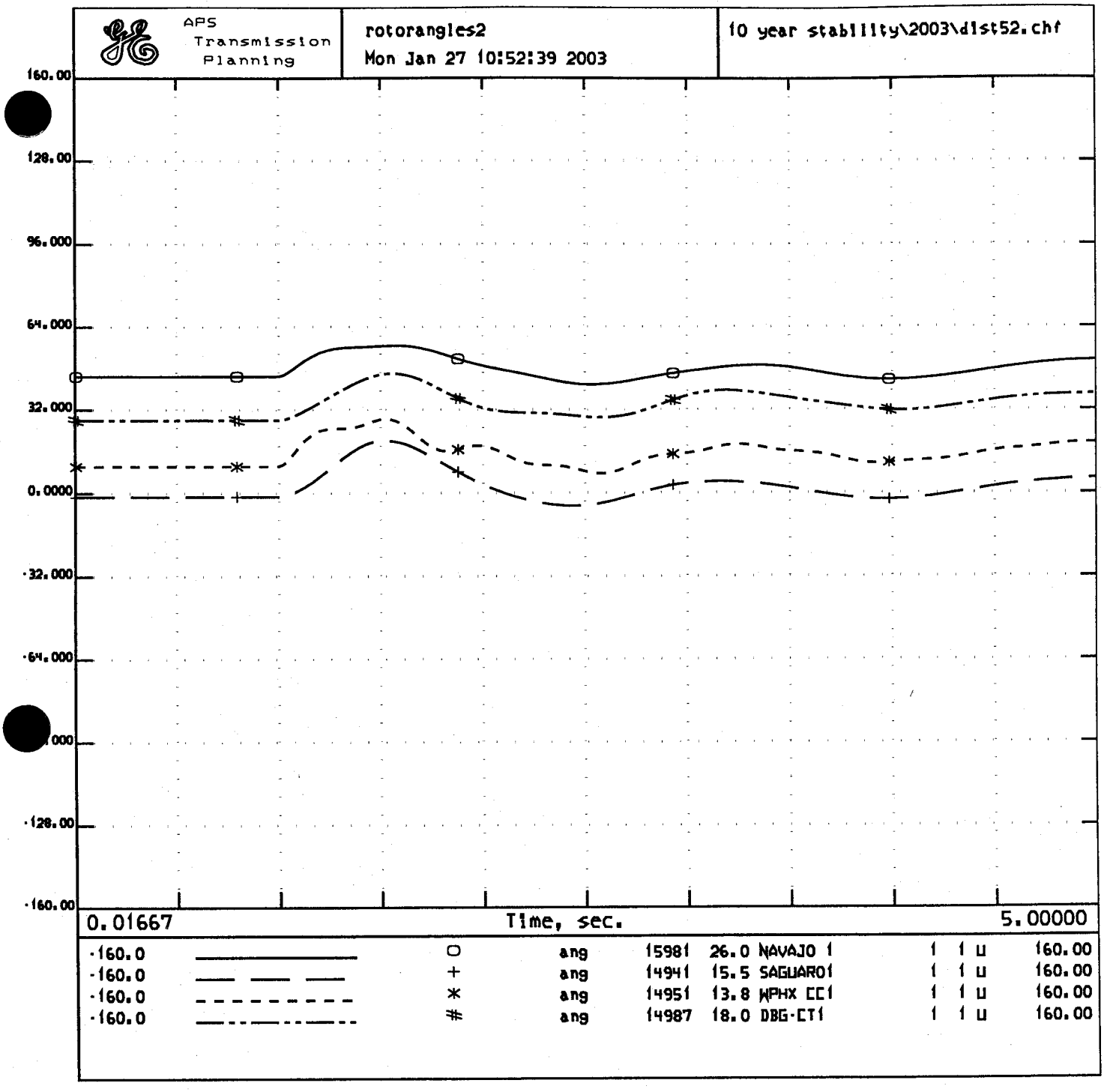
WESTERN SYSTEMS COORDINATING COUNCIL
PV FLT. w/PV - Devers line out
OCTOBER 29, 2001
PV-DEV STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-DEV8C REIN;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



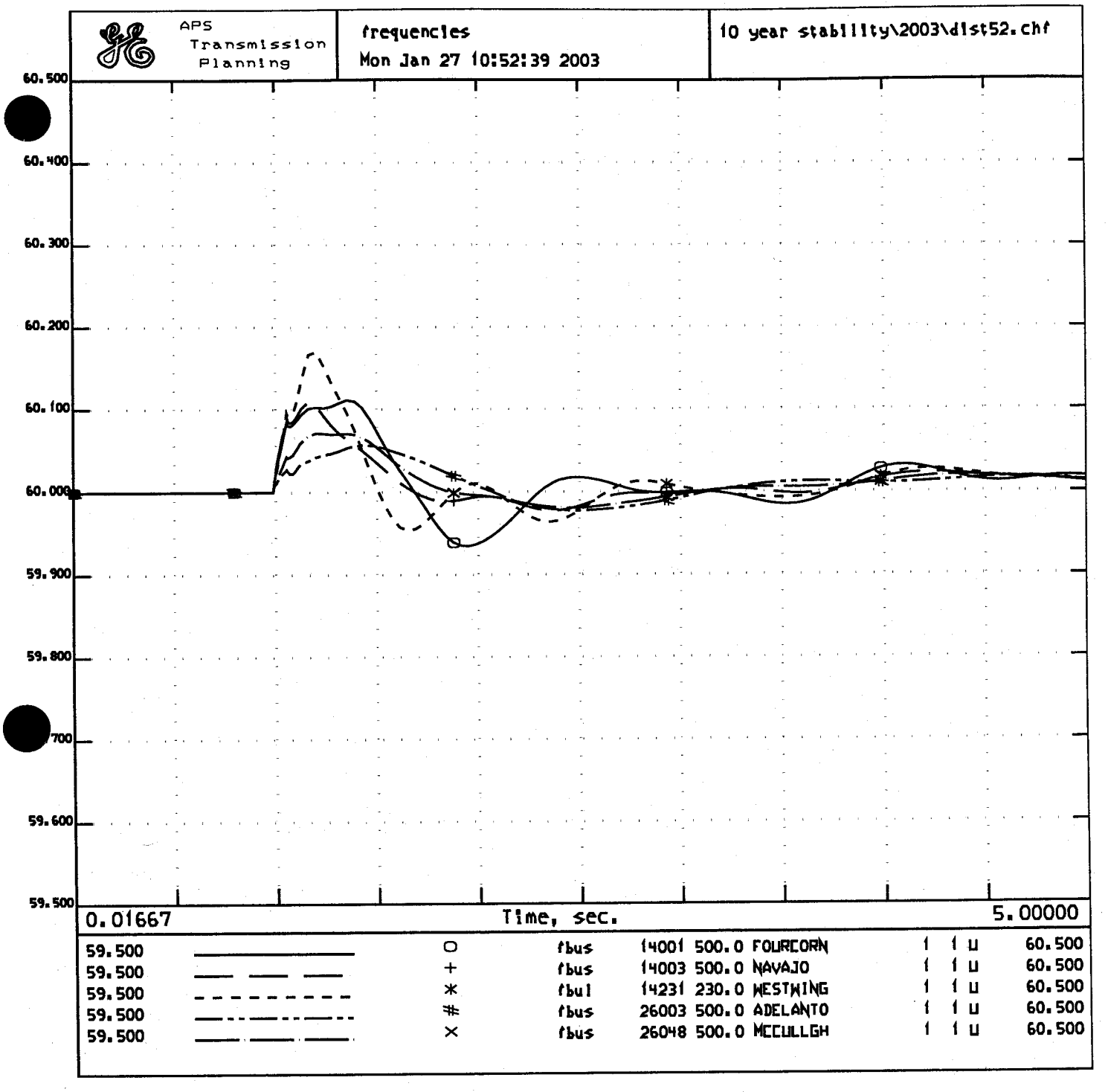
WESTERN SYSTEMS COORDINATING COUNCIL
PV FLT. w/PV - Devers line out
OCTOBER 29, 2001
PV-DEV STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-DEV8C REIN;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



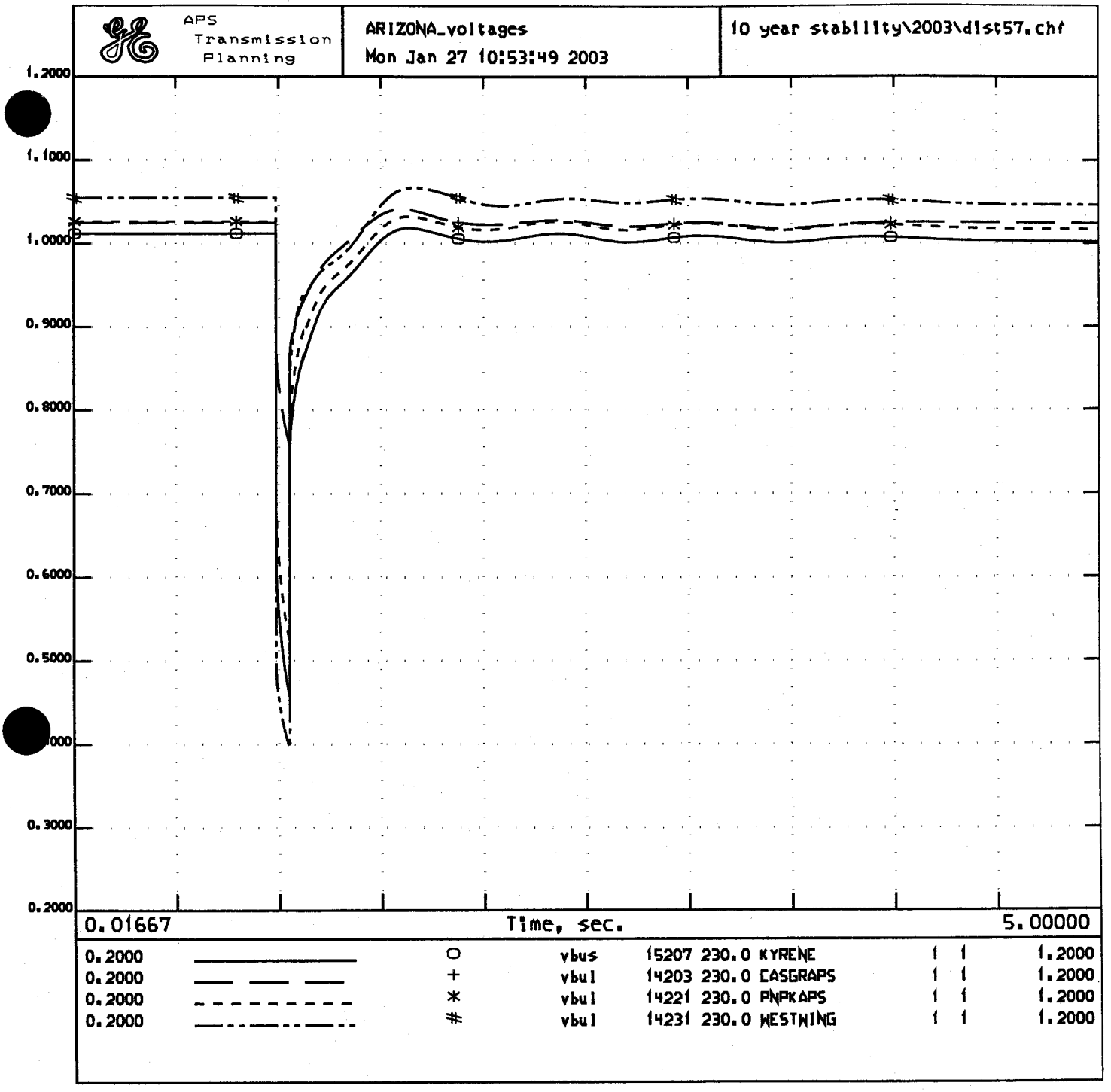
WESTERN SYSTEMS COORDINATING COUNCIL
PV FLT. w/PV - Devers line out
OCTOBER 29, 2001
PV-DEV STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-DEV8C REIN;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



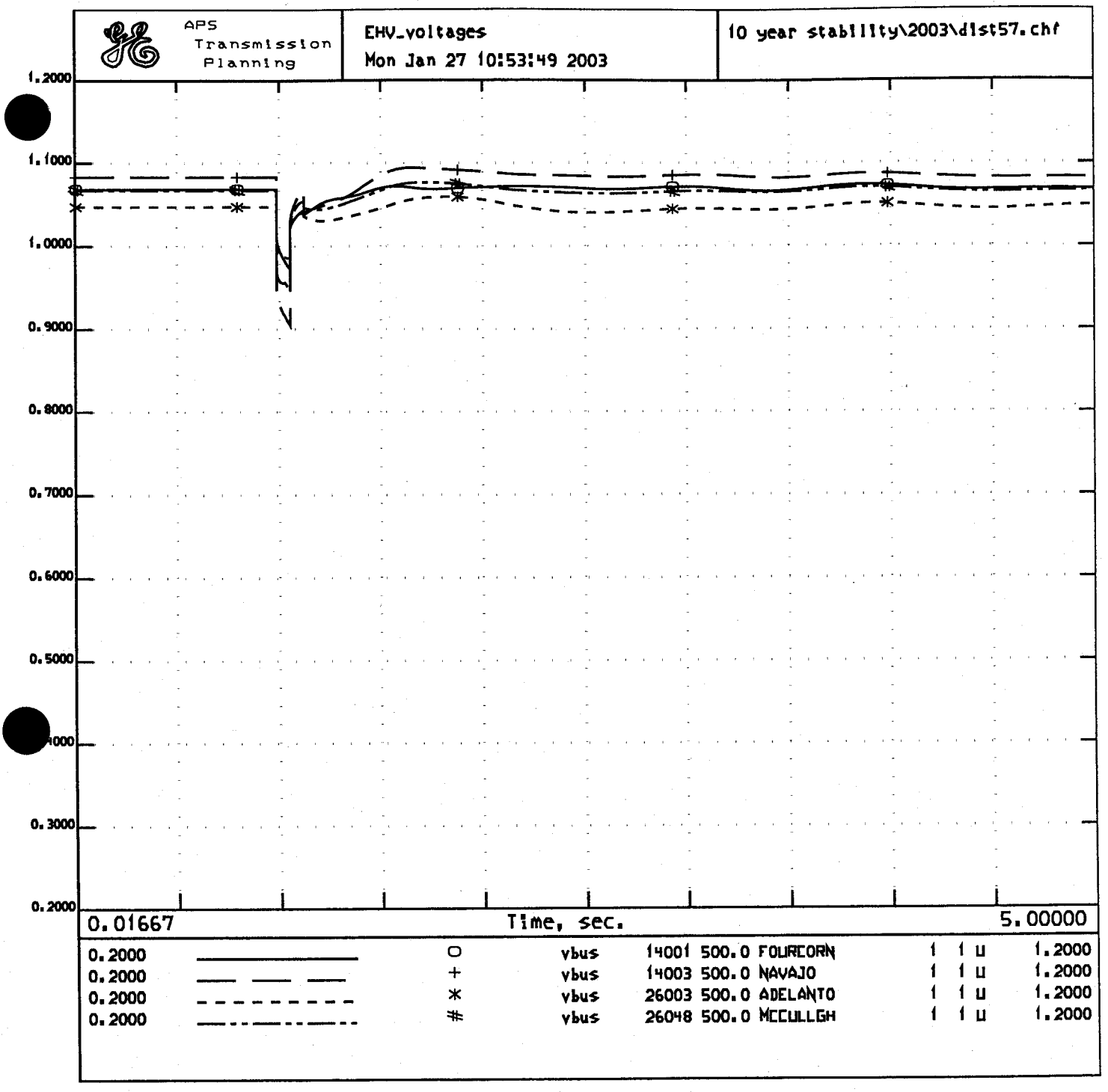
WESTERN SYSTEMS COORDINATING COUNCIL
PV FLT. w/PV - Devers line out
OCTOBER 29, 2001
PV-DEV STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-DEV8C REIN;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



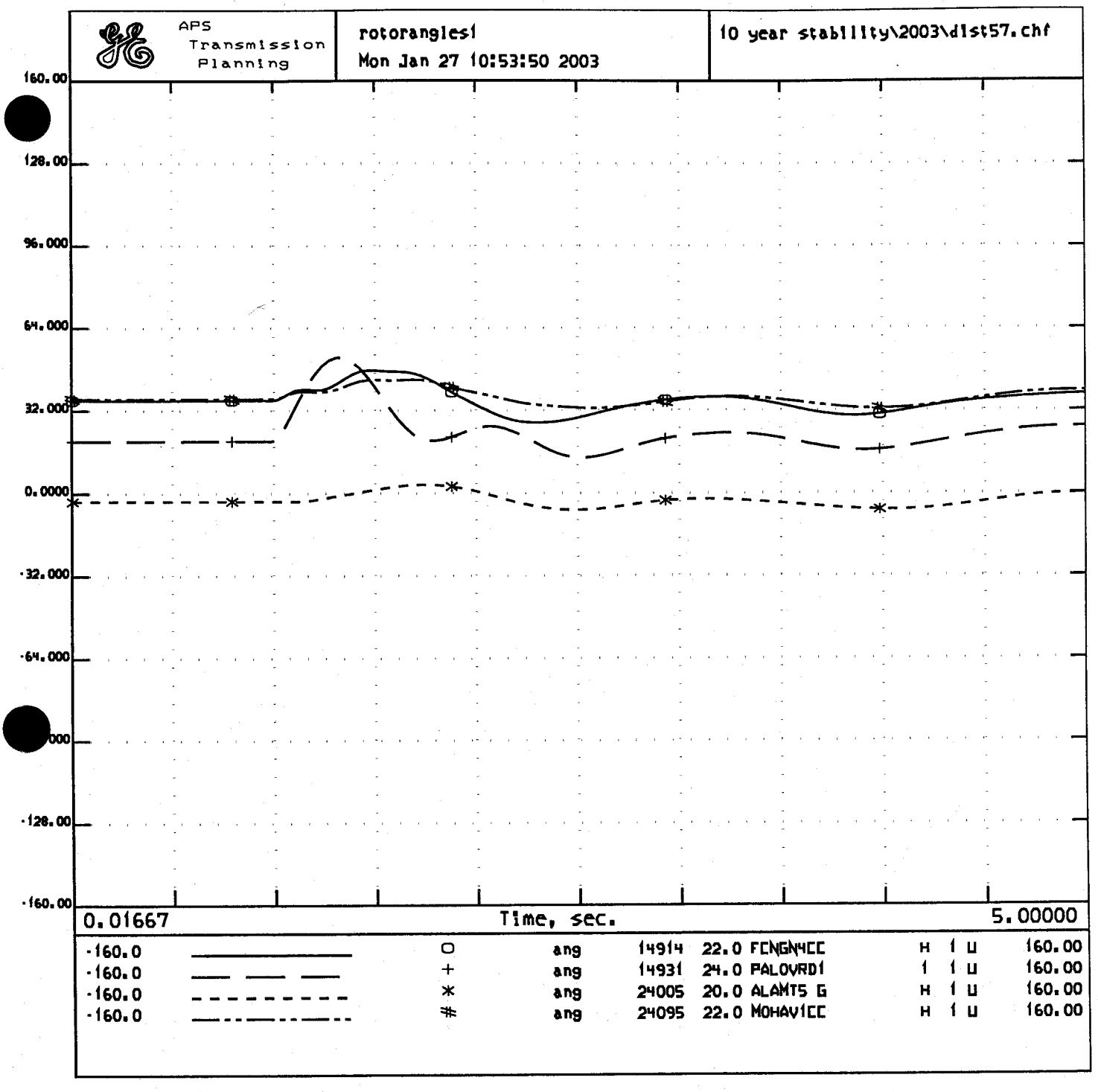
PALO VERDE FLT HASSY-JOJOBA LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
HAS-JJ STAB ;1; 01/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/HAS-JJ;8C REIN;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



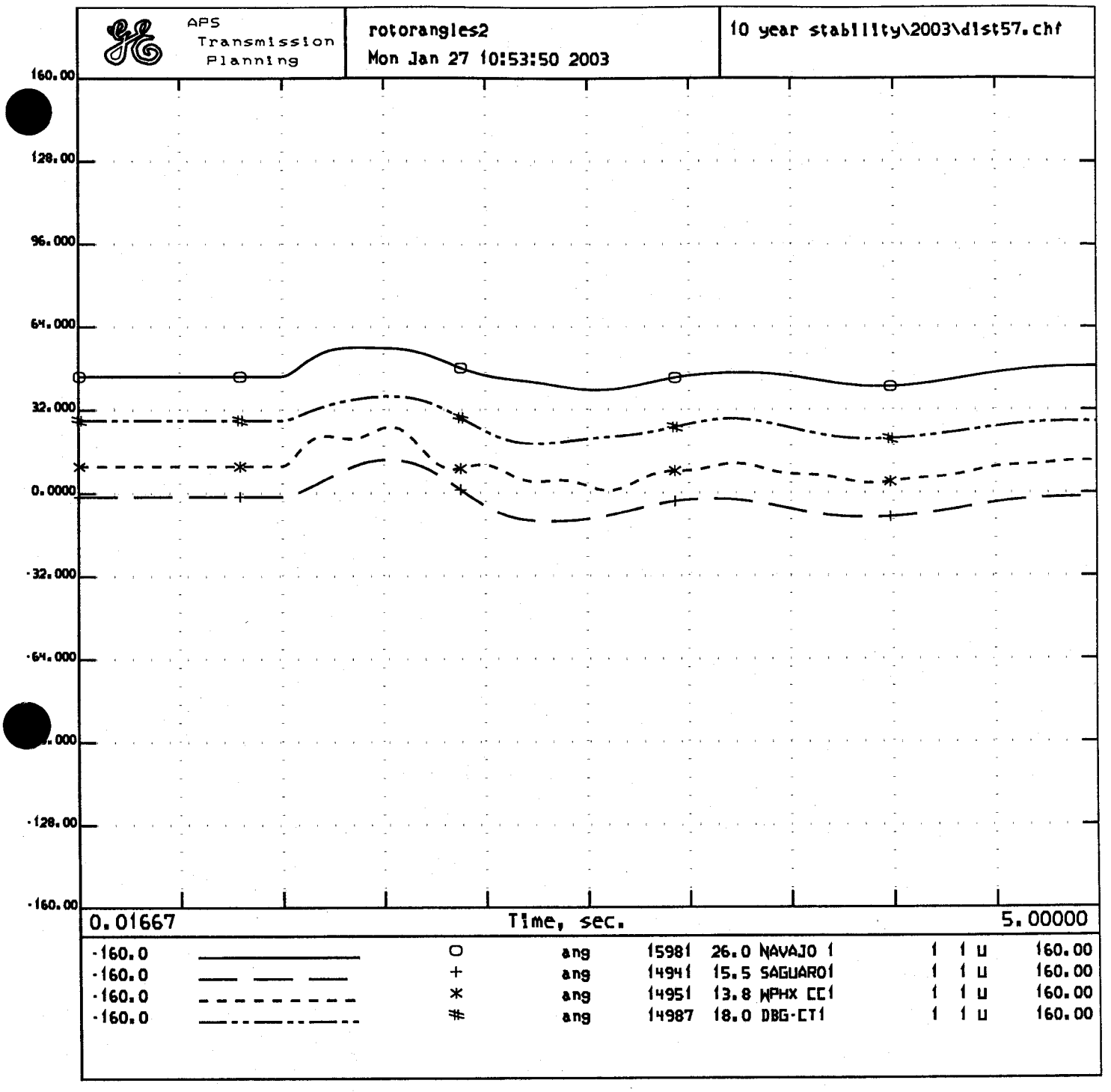
PALO VERDE FLT HASSY-JOJOBA LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
HAS-JJ STAB #1; 01/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/HAS-JJ;8C REIN;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



PALO VERDE FLT HASSY-JOJOBA LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
HAS-JJ STAB #1; 01/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/HAS-JJ;8C REIN;2003.dyd;WSCC.bpt

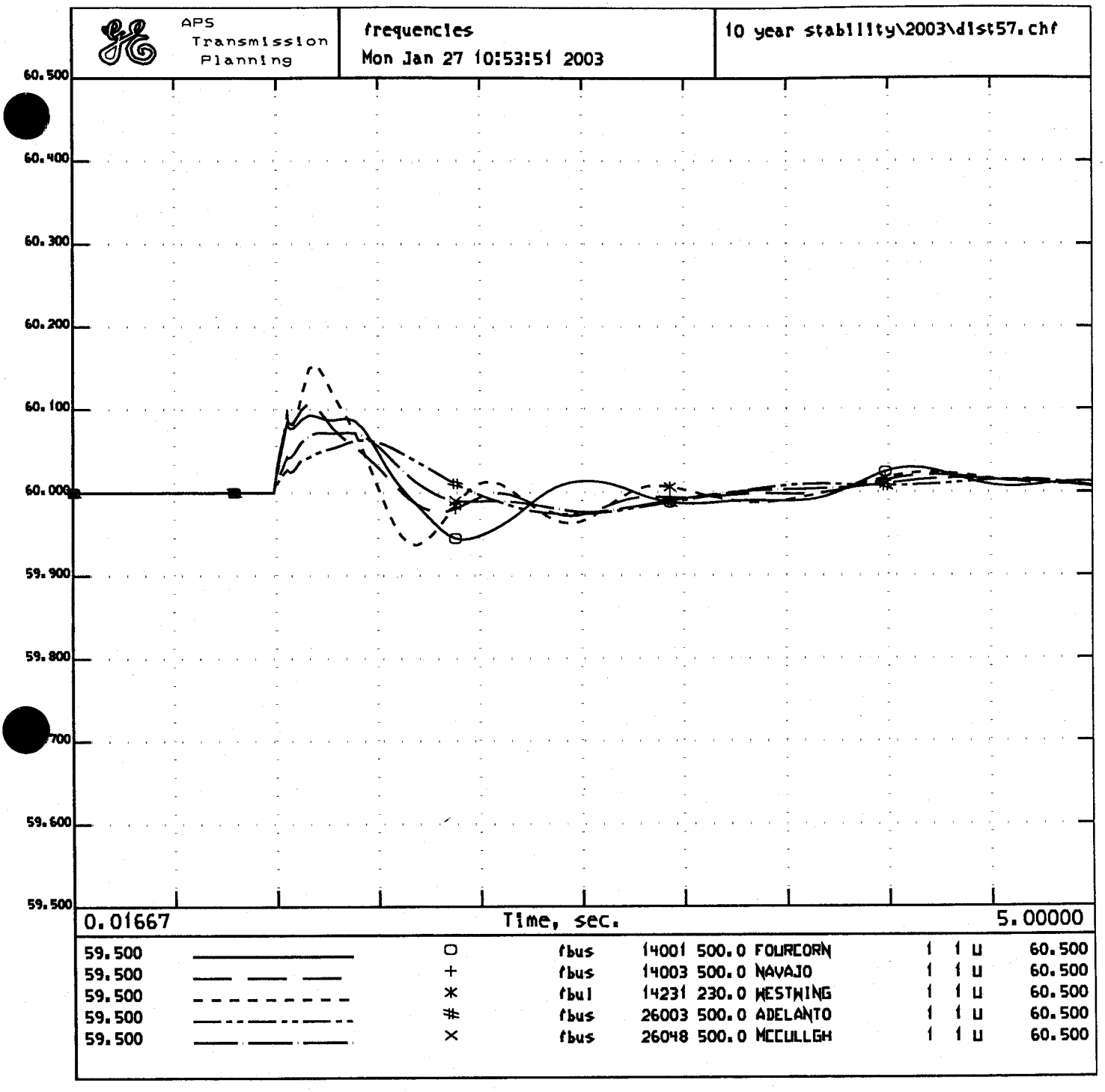
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



PALO VERDE FLT HASSY-JOJOBA LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
HAS-JJ STAB #1; 01/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/HAS-JJ;8C REIN;2003.dyd;WSCC.bpt

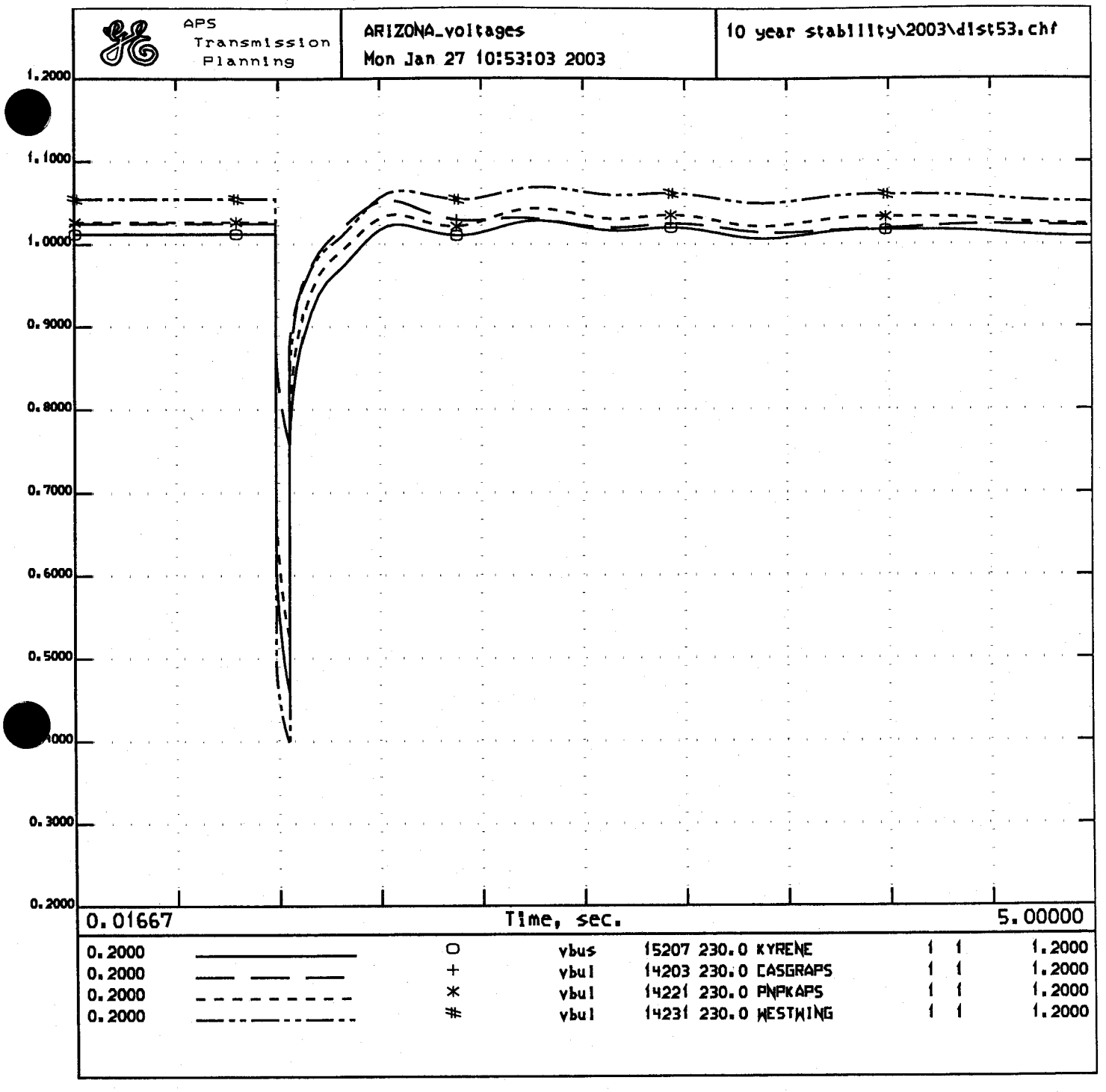
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

B94



PALO VERDE FLT HASSY-JOJOBA LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
HAS-JJ STAB ;1; 01/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/HAS-JJ;8C REIN;2003.dyd;WSCC.bpt

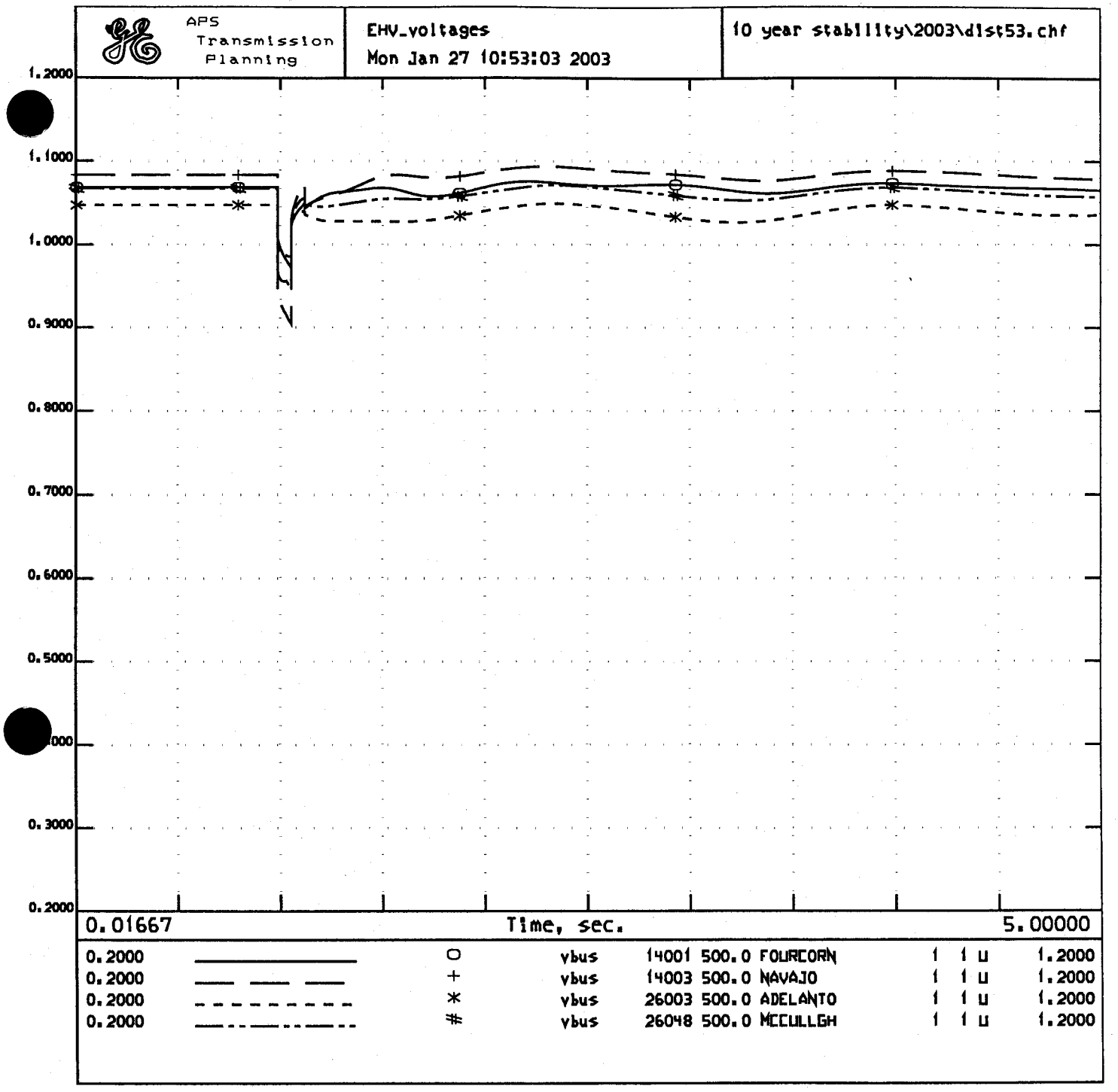
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



WESTERN SYSTEMS COORDINATING COUNCIL
PV FLT. W/HASSY-N.GILA line out
OCTOBER 29, 2001
PV-NGILA STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-NG;8C REIN;2003.dyd;WSCC.bat

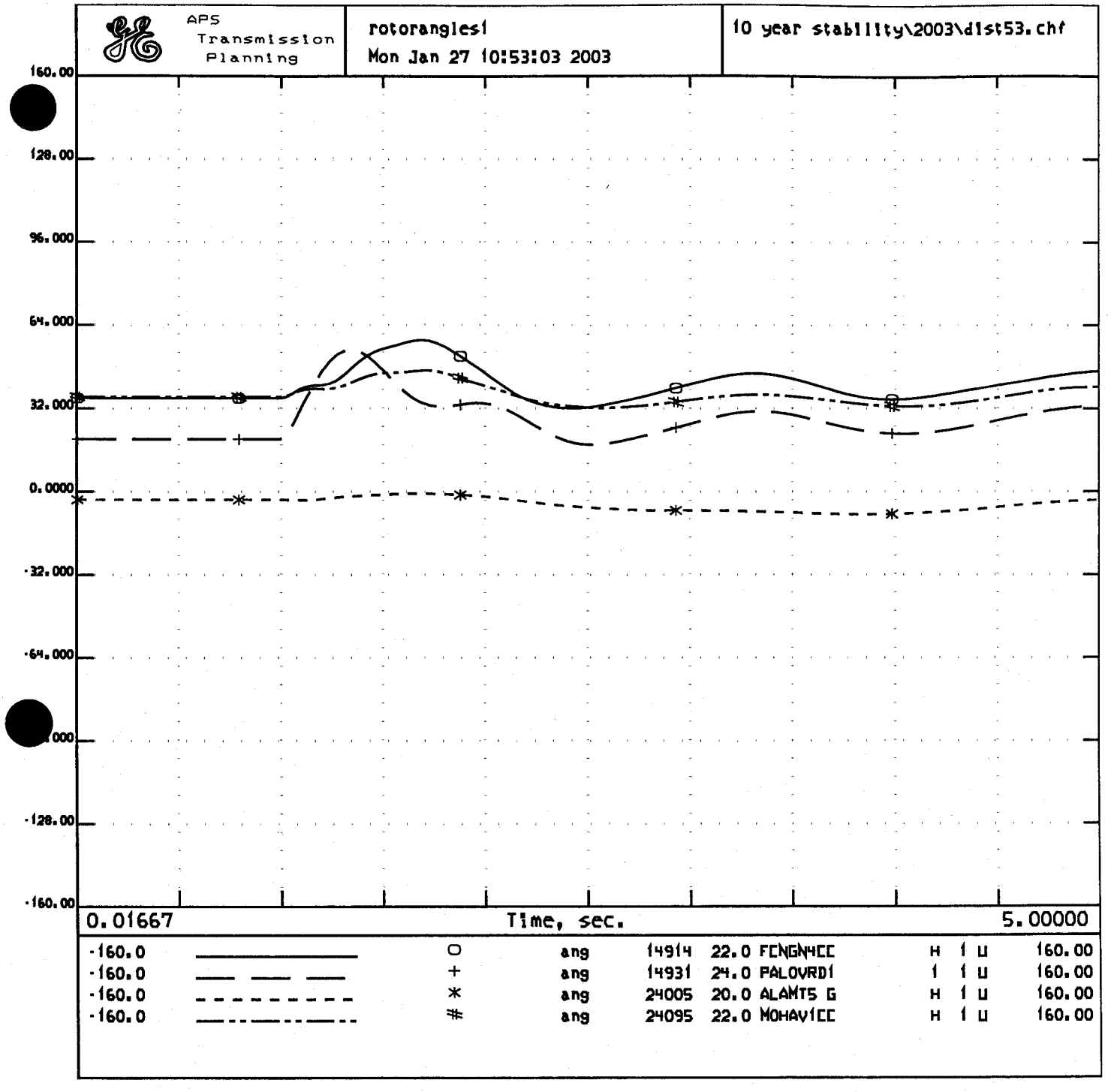
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

B96



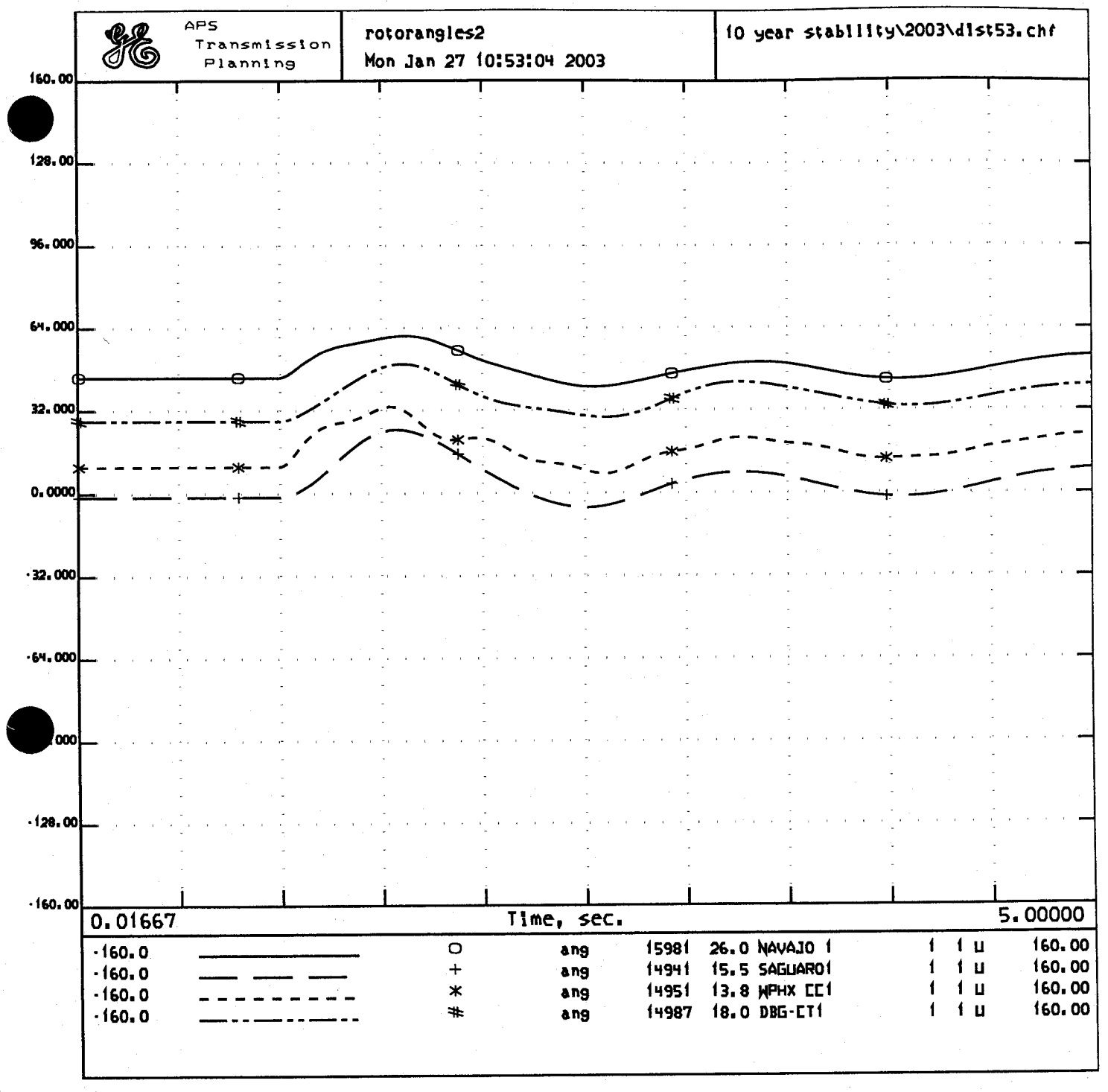
WESTERN SYSTEMS COORDINATING COUNCIL
PV FLT. W/HASSY-N.GILA line out
OCTOBER 29, 2001
PV-NGILA STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-NG;8C REIN;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



WESTERN SYSTEMS COORDINATING COUNCIL
PV FLT. w/HASSY-N.GILA line out
OCTOBER 29, 2001
PV-NGILA STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-NG;8C REIN;2003.dyd;WSCC.bat

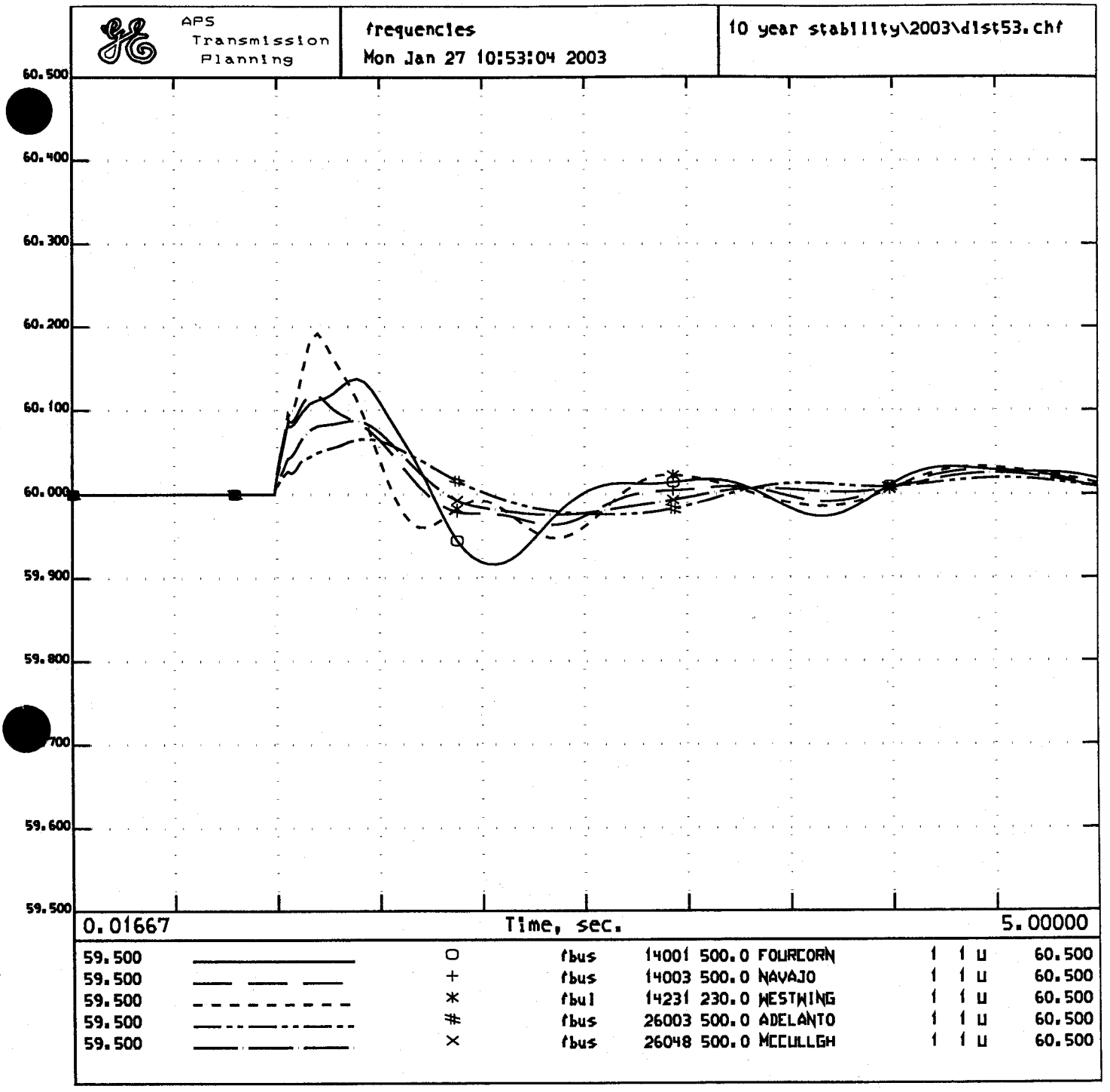
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



WESTERN SYSTEMS COORDINATING COUNCIL
PV FLT. w/HASSY-N.GILA line out
OCTOBER 29, 2001
PV-NGILA STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-NG;8C REIN;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

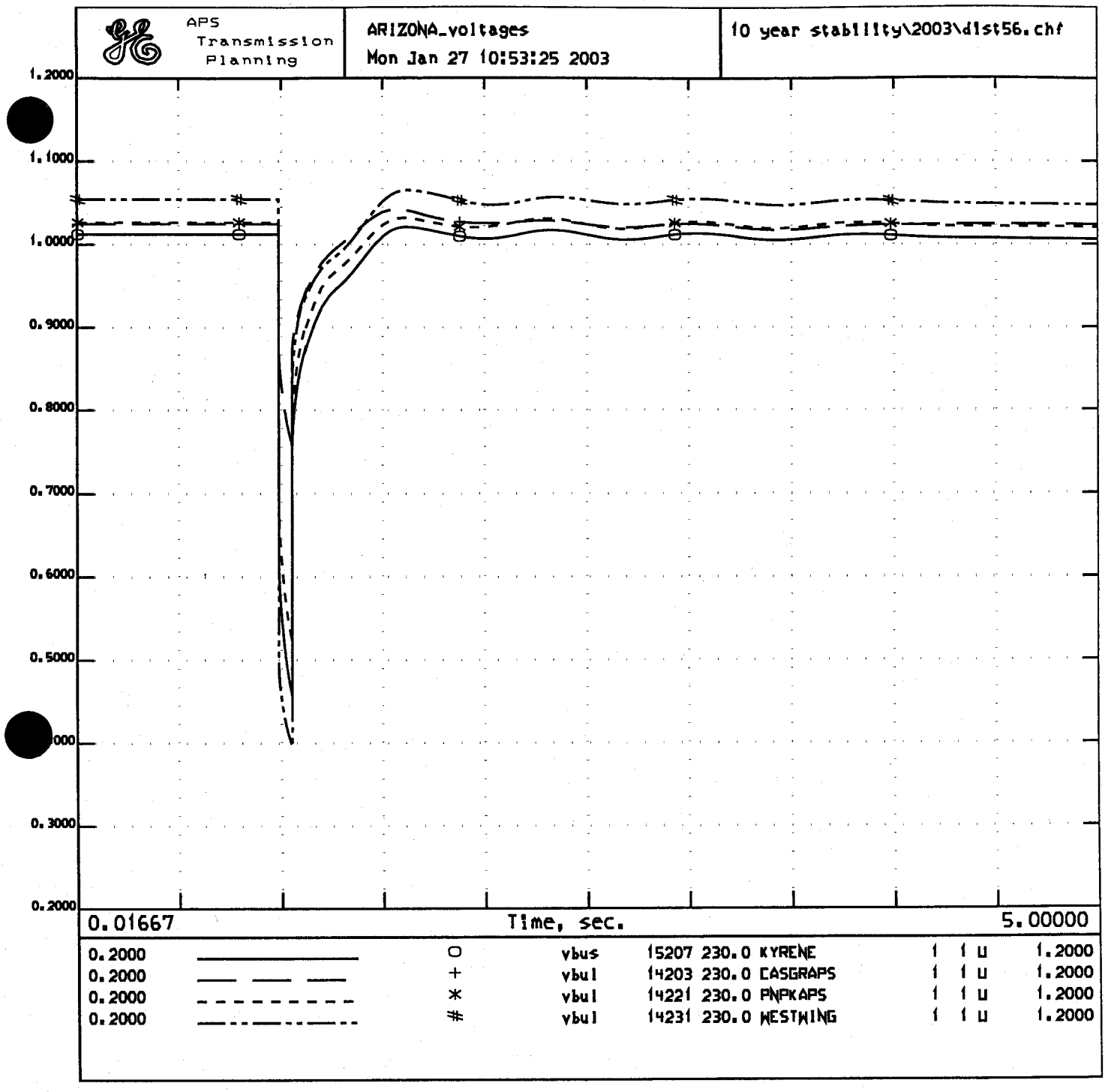
B99



WESTERN SYSTEMS COORDINATING COUNCIL
PV FLT. W/HASSY-N.GILA line out
OCTOBER 29, 2001
PV-NGILA STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-NG;8C REIN;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

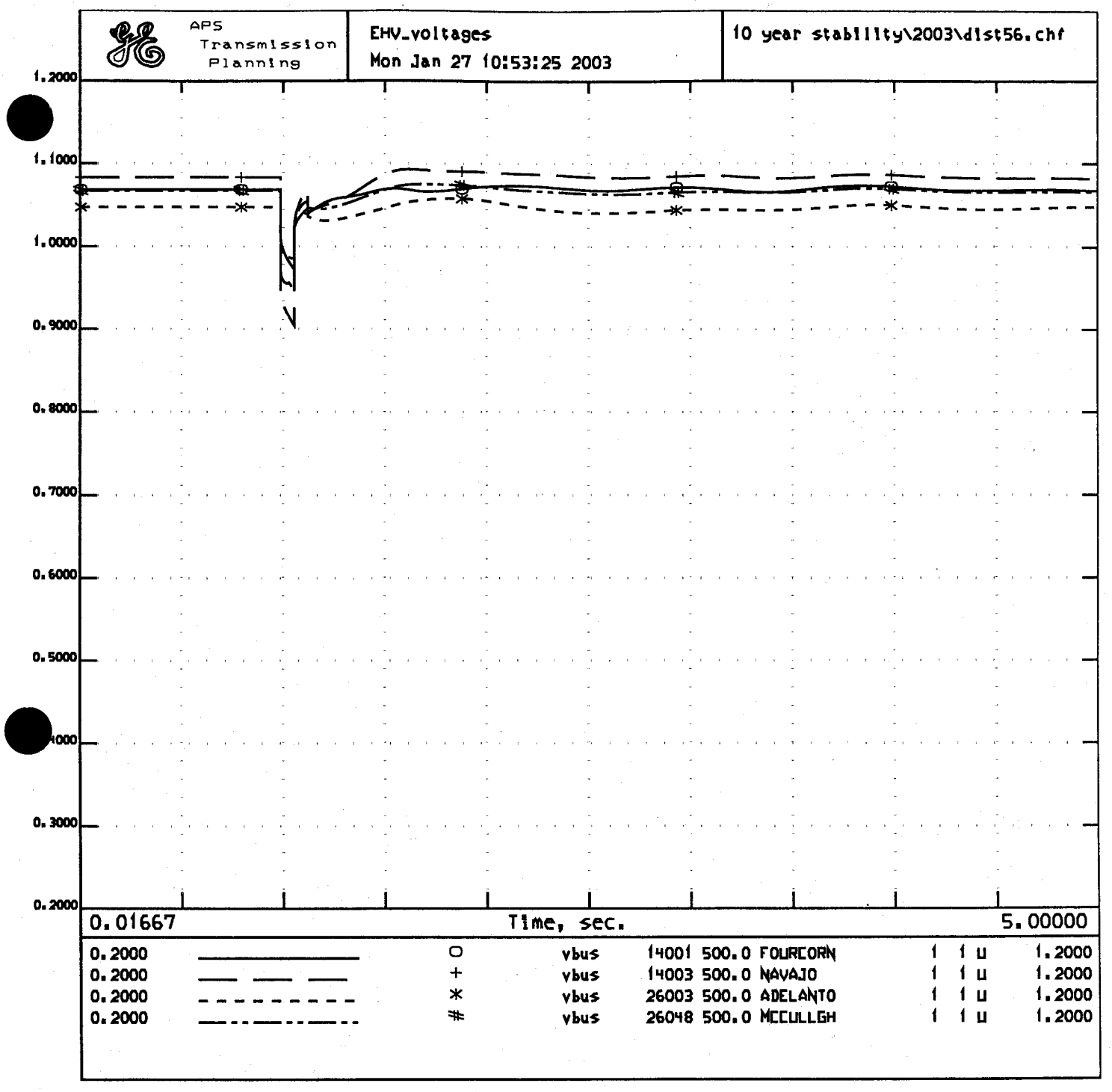
B100



PALO VERDE FLT PV-RUDD LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
PV-RUDD STAB .1; 01/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-RD;8C REIN;2003.dyd;WSCC.bpt

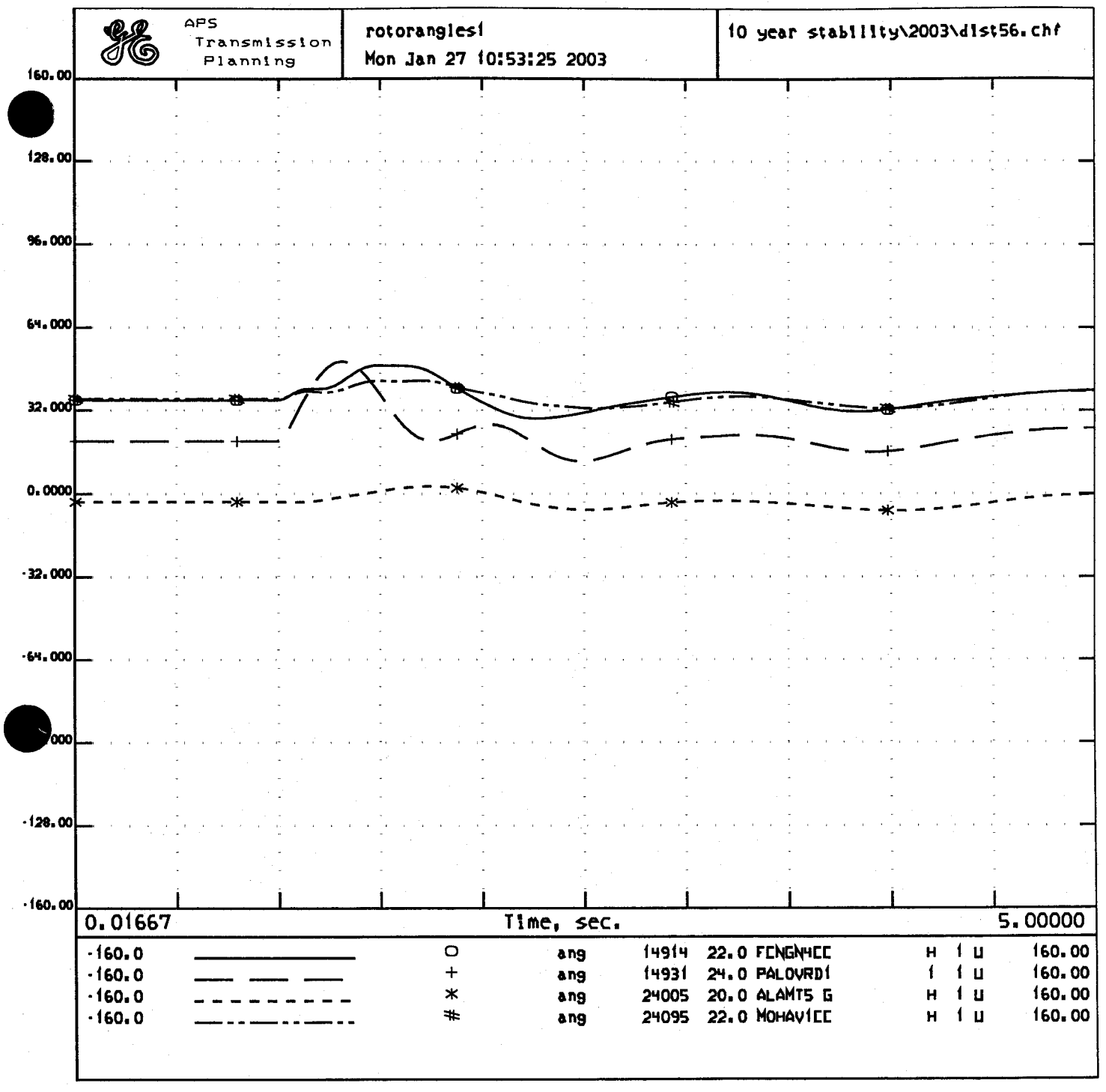
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

B101



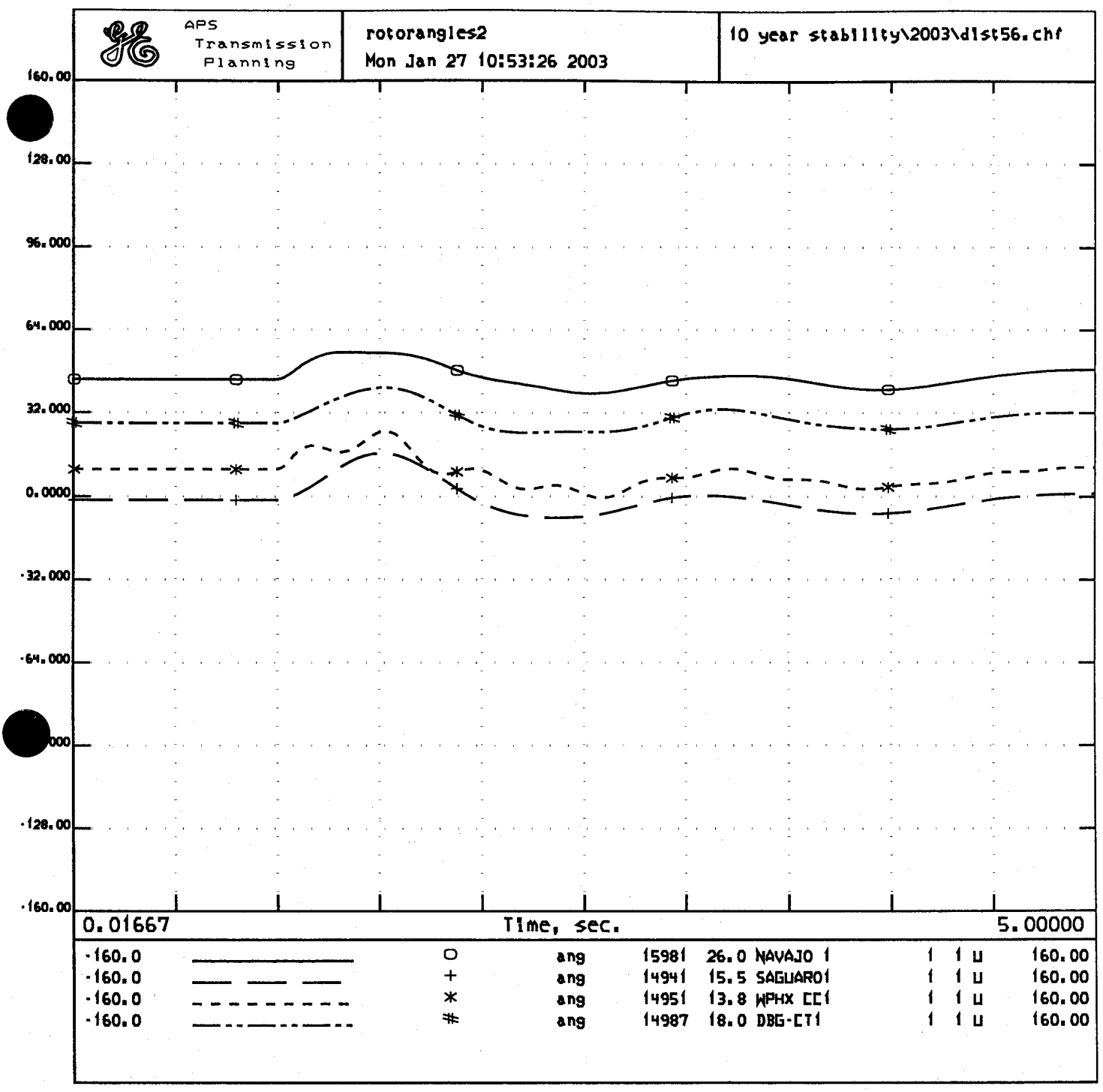
PALO VERDE FLT PV-RUDD LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
PV-RUDD STAB #1; 01/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-RD;8C REIN;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



PALO VERDE FLT PV-RUDD LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
PV-RUDD STAB .1; 01/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-RD;8C REIN;2003.dyd;WSCC.bpt

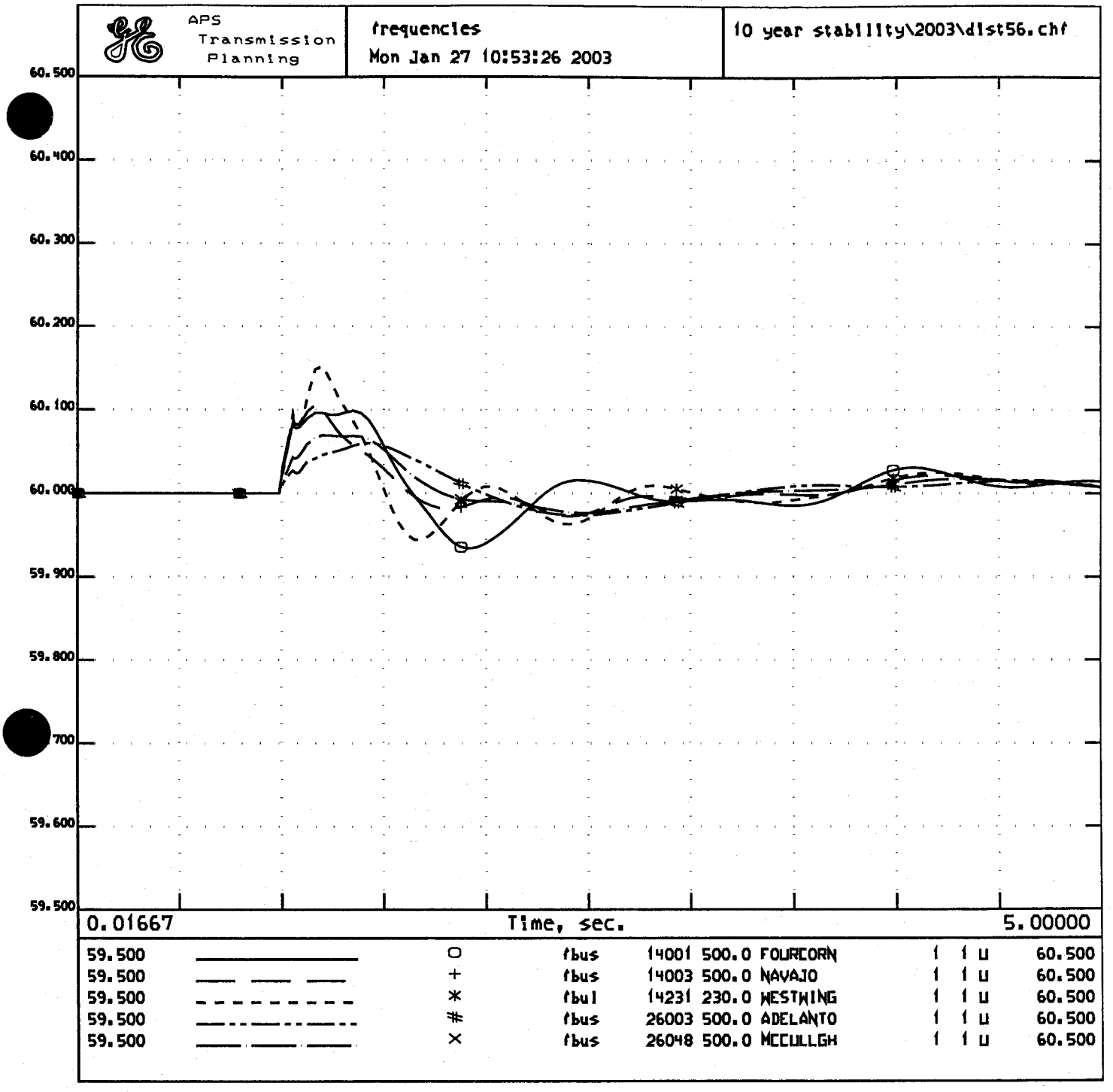
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



PALO VERDE FLT PV-RUDD LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
PV-RUDD STAB *1; 01/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-RD;8C REIN;2003.dyd;WSCC.bpt

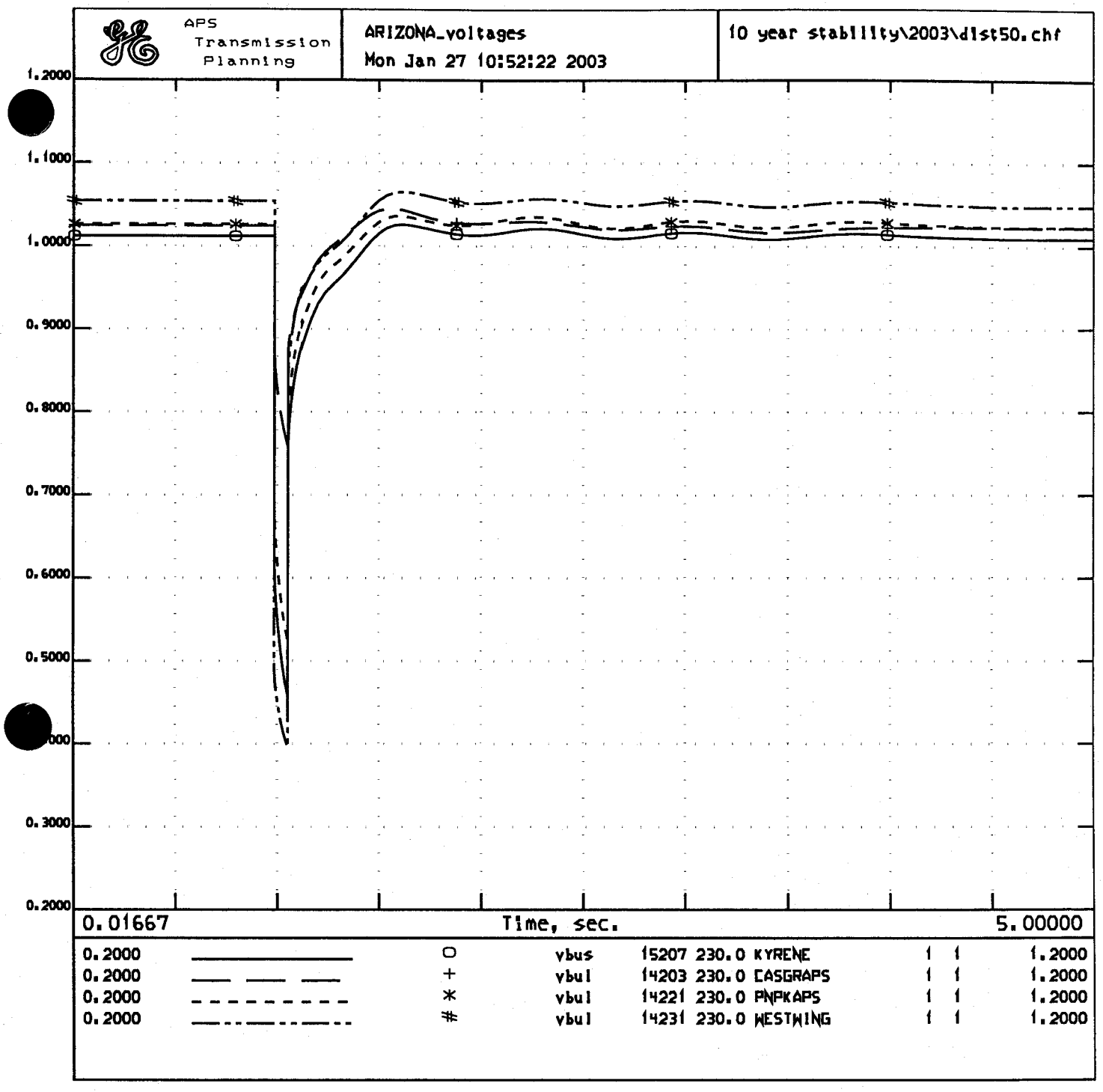
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

B104



PALO VERDE FLT PV-RUDD LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
PV-RUDD STAB .1; 01/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-RD;8C REIN;2003.dyd;WSCC.bpt

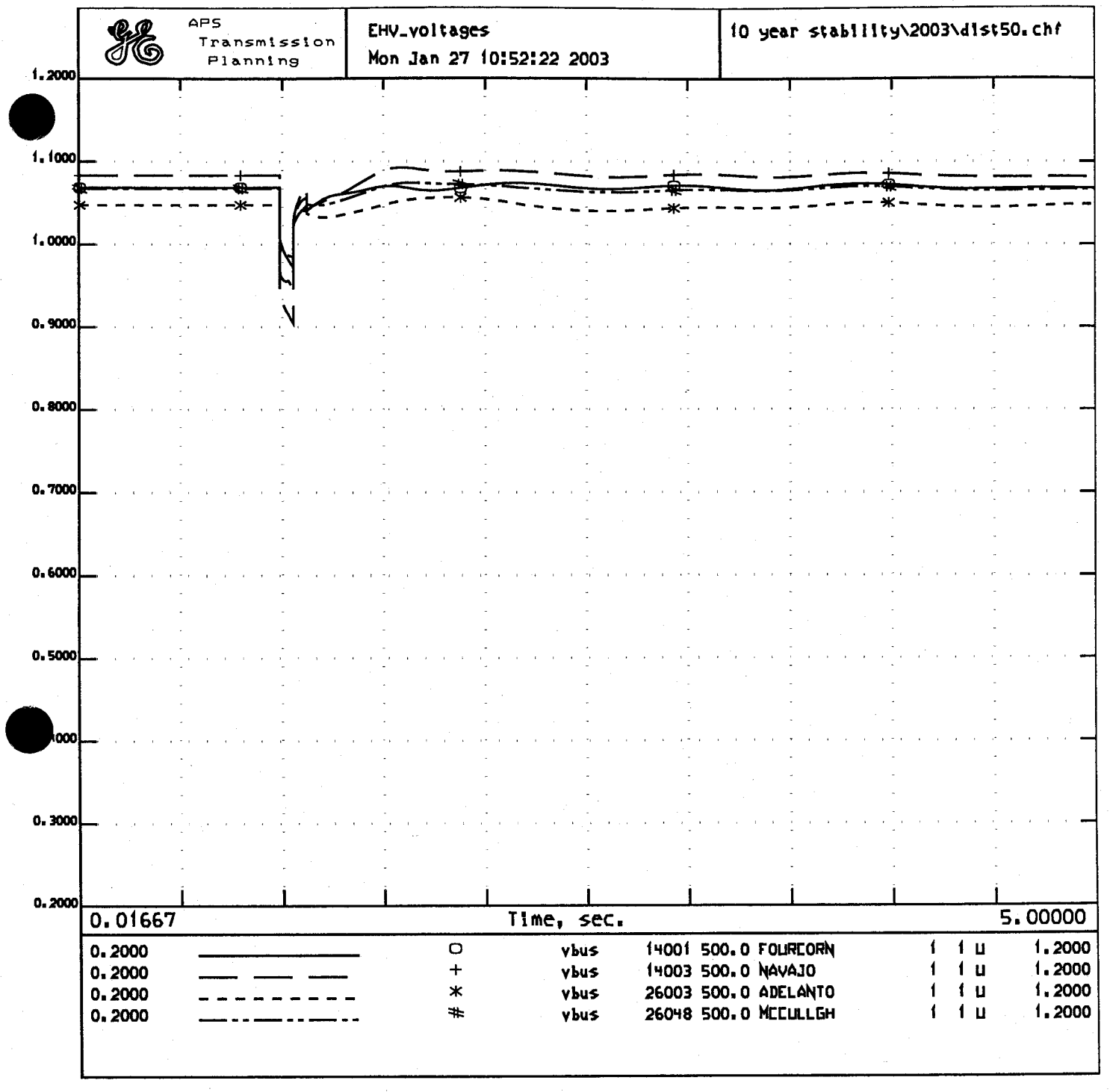
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



WESTERN SYSTEMS COORDINATING COUNCIL
PV FLT w/PV-WW line out
OCTOBER 29, 2001
PV-WWG STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-WW;8C REIN;2003.dyd;WSCC.bat

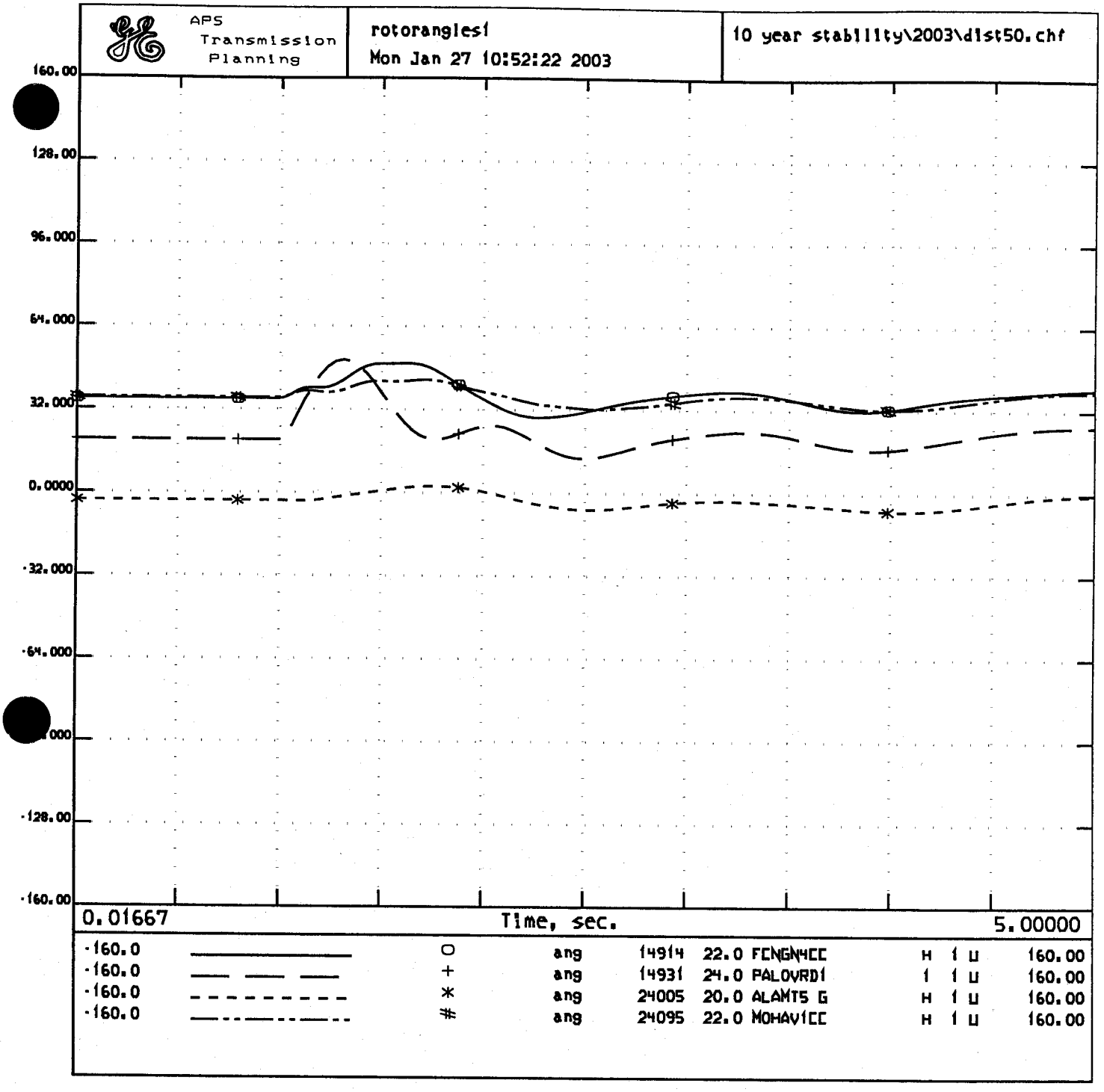
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

B106



WESTERN SYSTEMS COORDINATING COUNCIL
PV FLT w/PV-WW line out
OCTOBER 29, 2001
PV-WWG STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-WW;8C REIN;2003.dyd;WSCC.bat

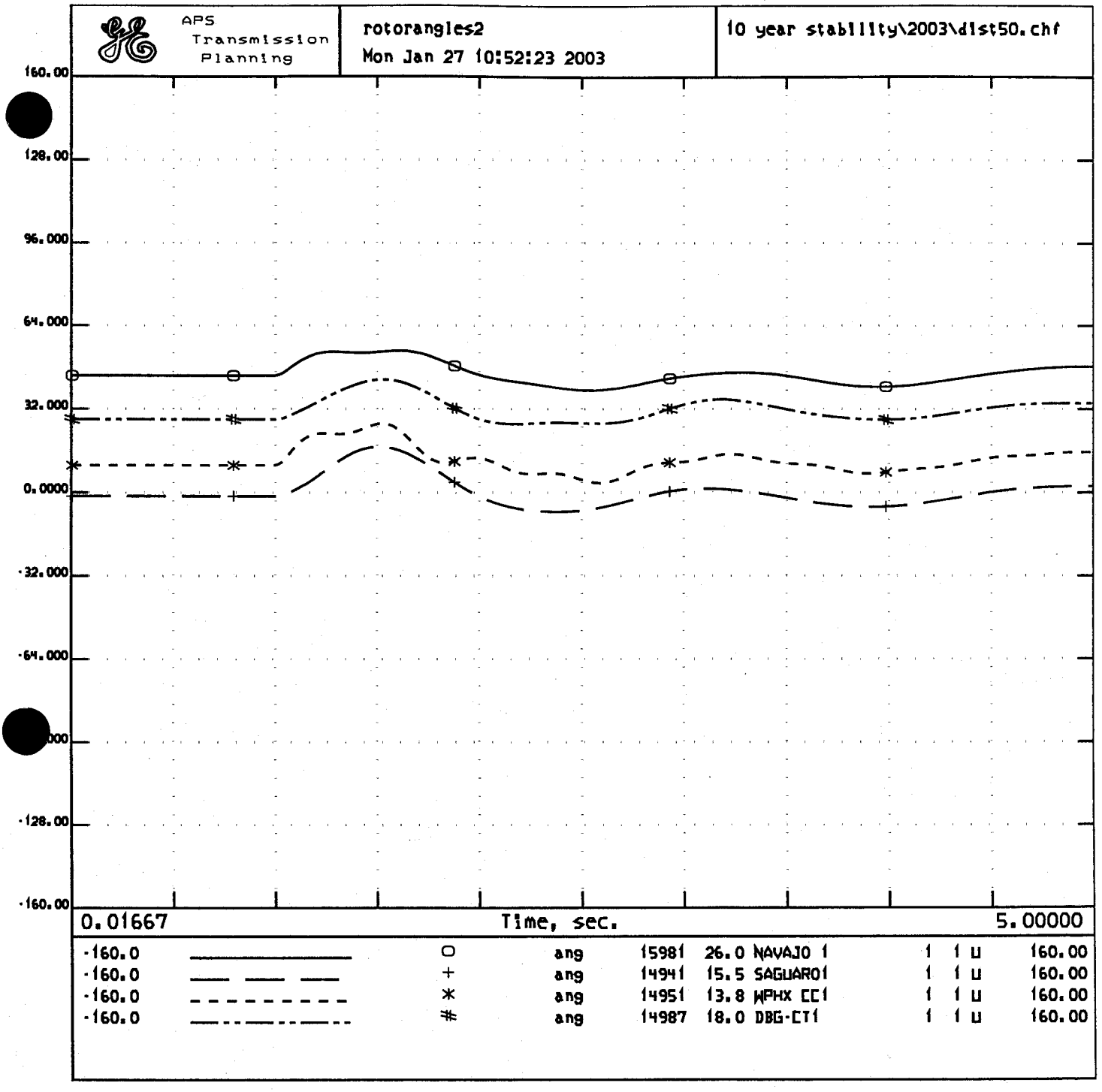
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



WESTERN SYSTEMS COORDINATING COUNCIL
PV FLT w/PV-WW line out
OCTOBER 29, 2001
PV-WWG STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-WW;8C REIN;2003.dyd;WSCC.bat

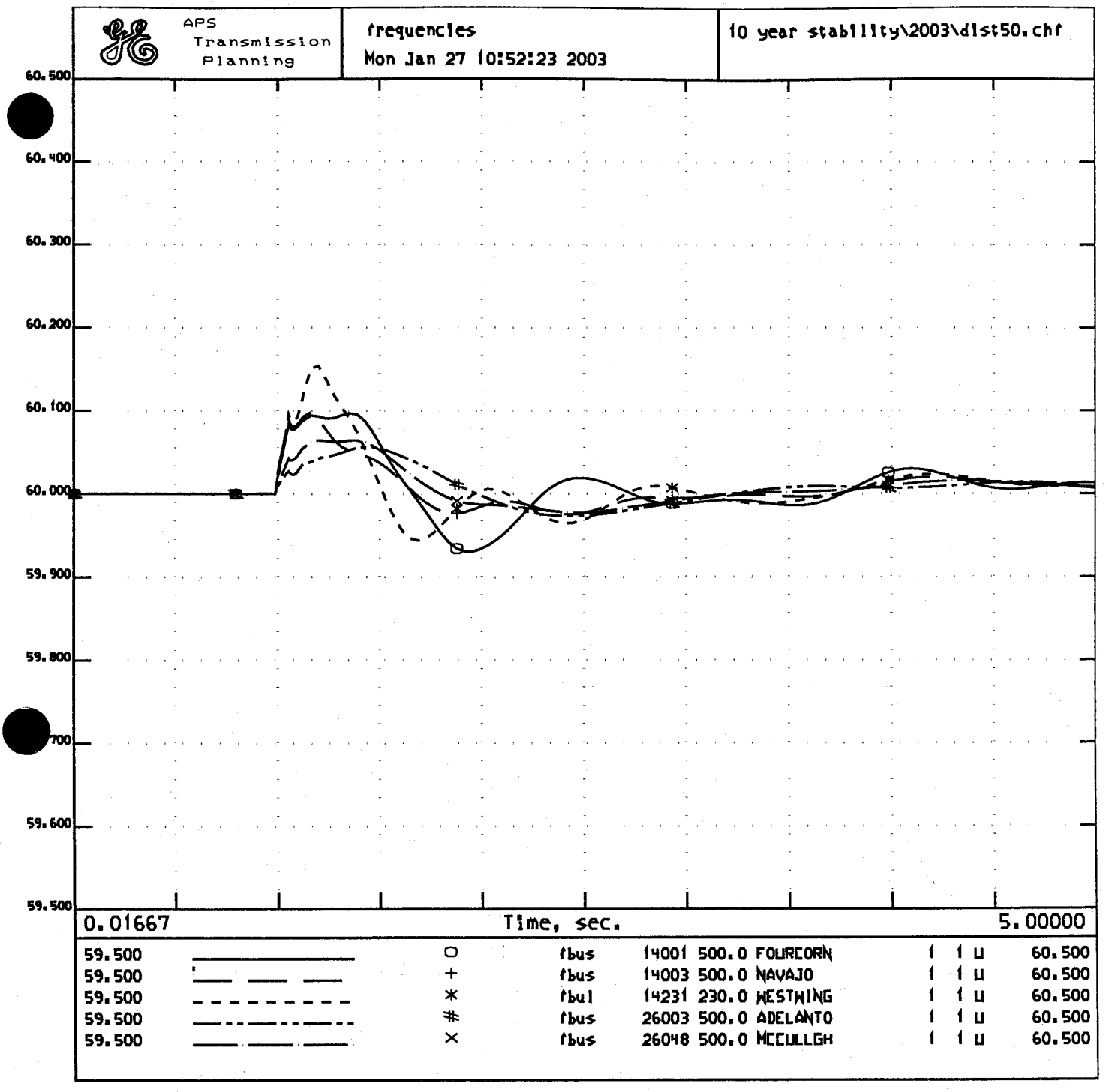
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

B108



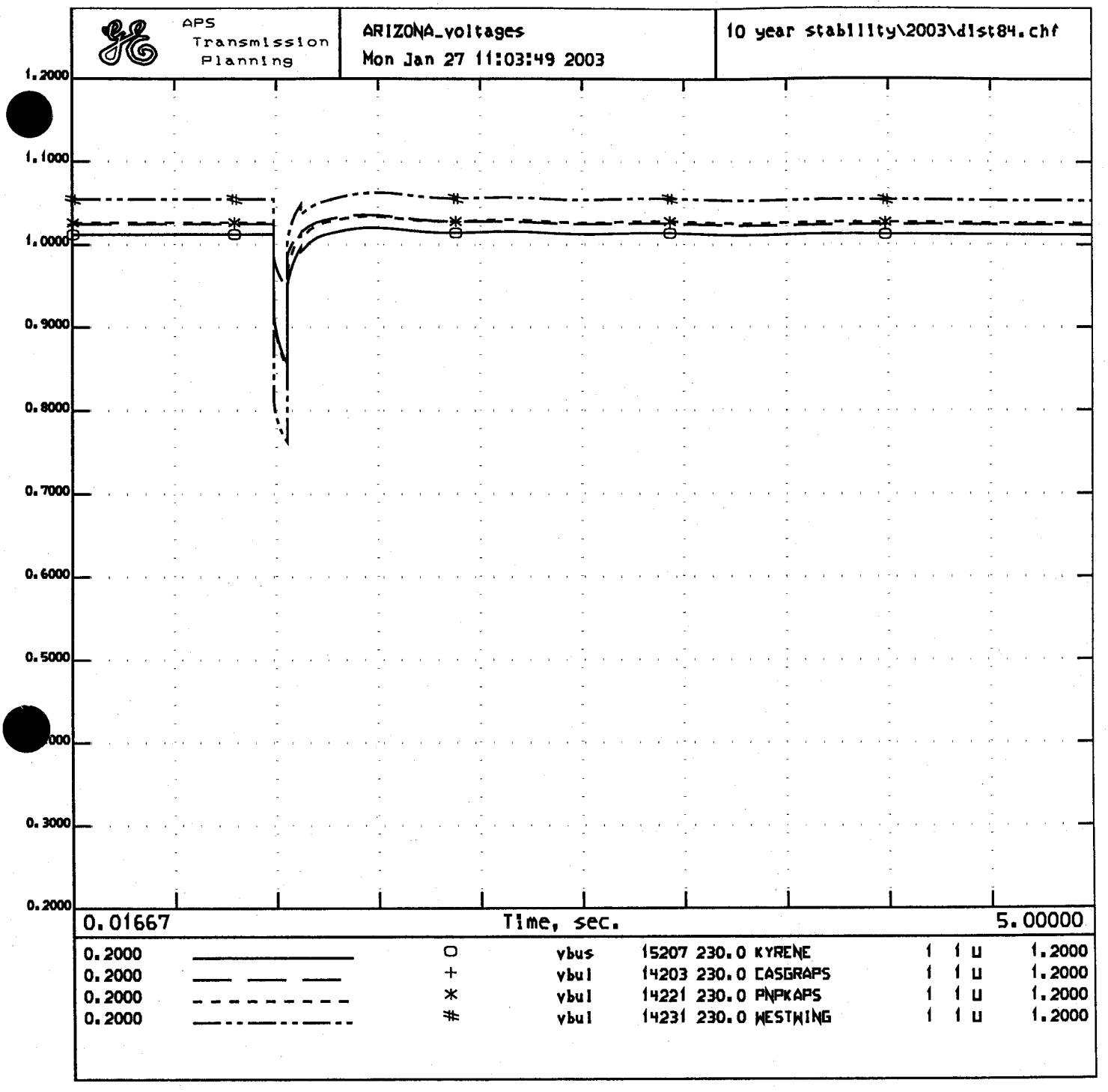
WESTERN SYSTEMS COORDINATING COUNCIL
PV FLT w/PV-WW line out
OCTOBER 29, 2001
PV-WWG STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-WW;8C REIN;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



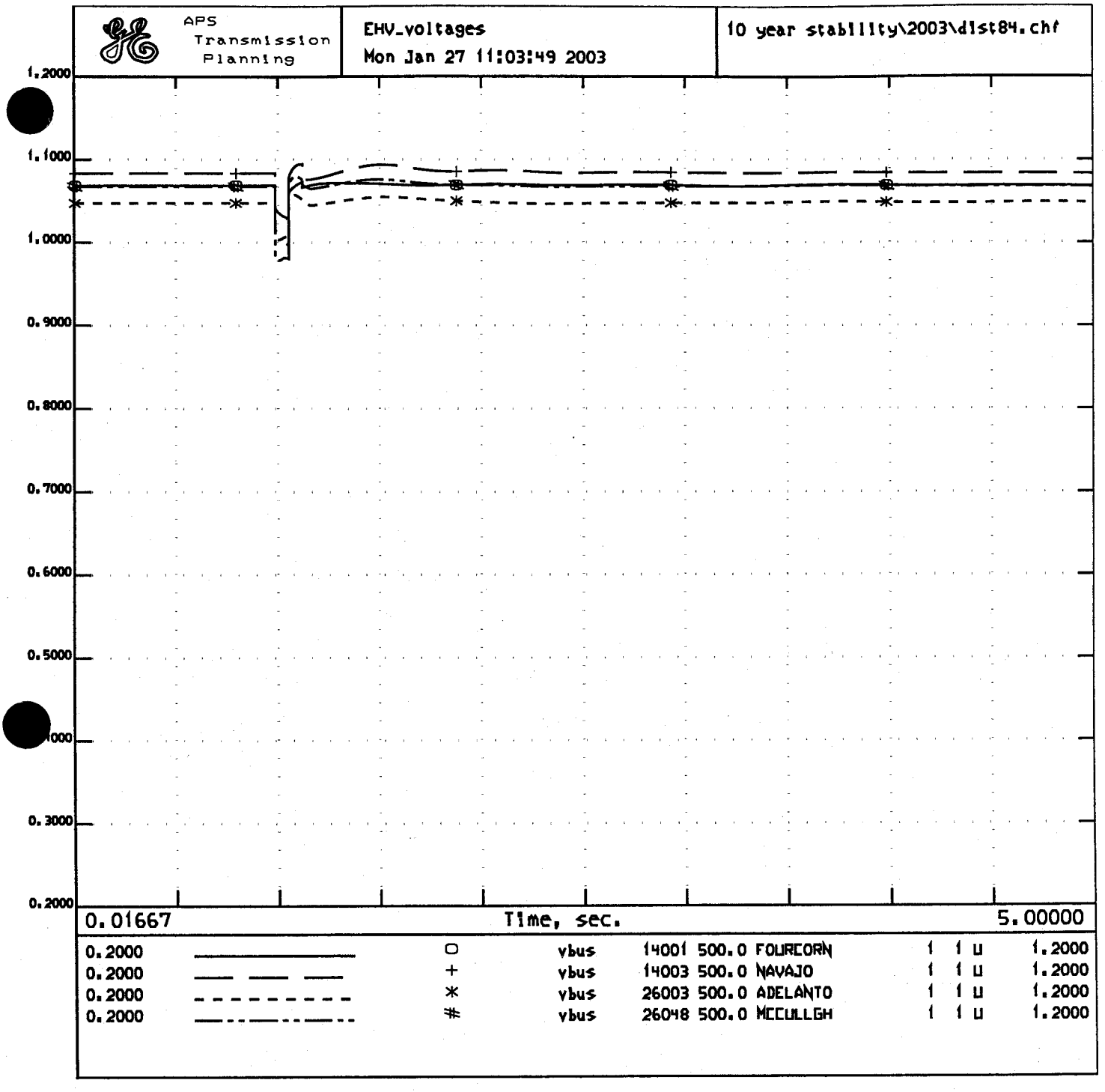
WESTERN SYSTEMS COORDINATING COUNCIL
PV FLT w/PV-WW line out
OCTOBER 29, 2001
PV-WWG STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-WW;8C REIN;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



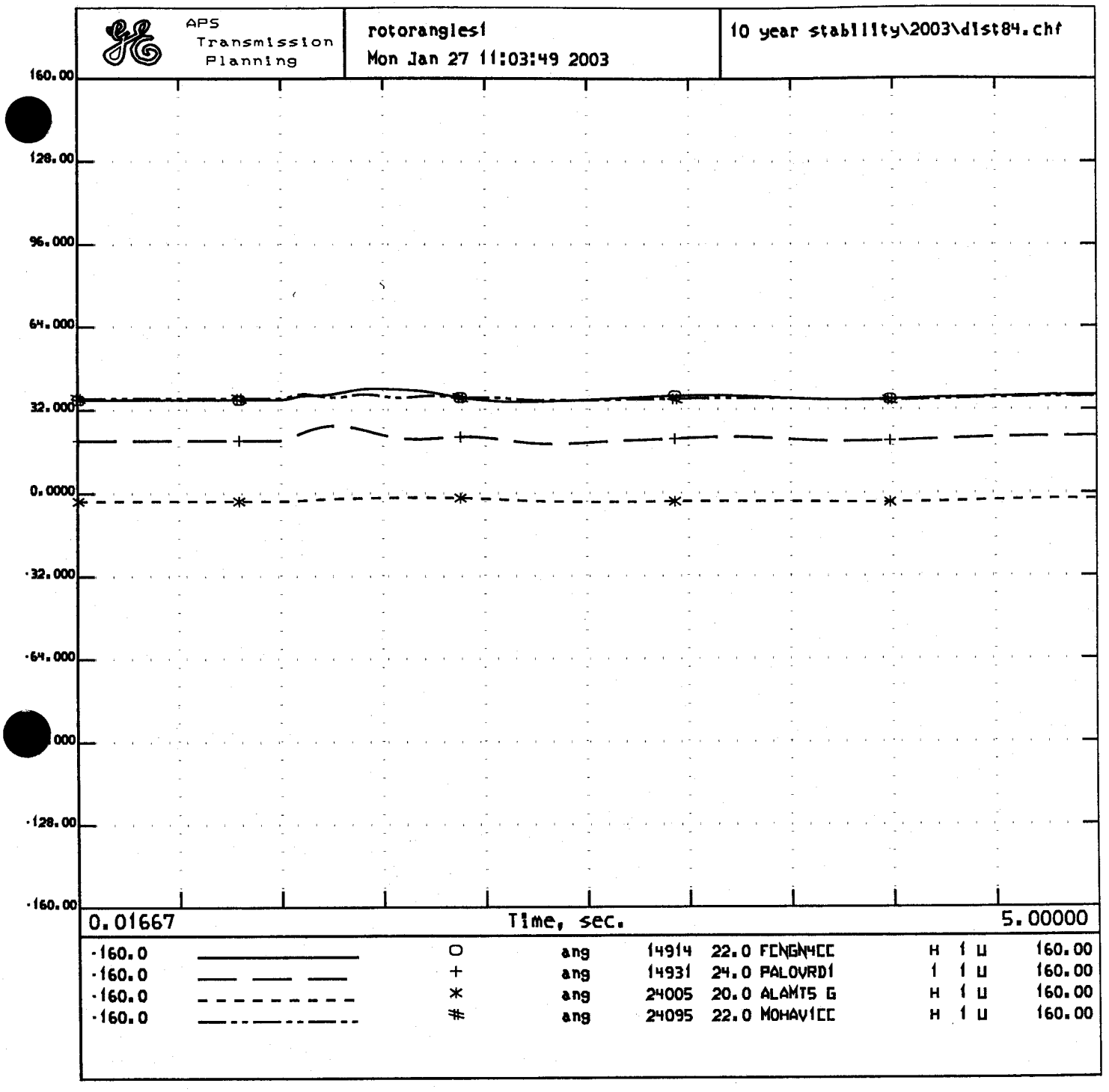
PERKINS FLT PERKINS-MEAD LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
PERK-MEAD STAB; 01/03; T=0 3P FLT PERK500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MKP/WWG;4C CLR FLT W/PERK-MEAD;8C REIN;2003.dyd;WSEC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



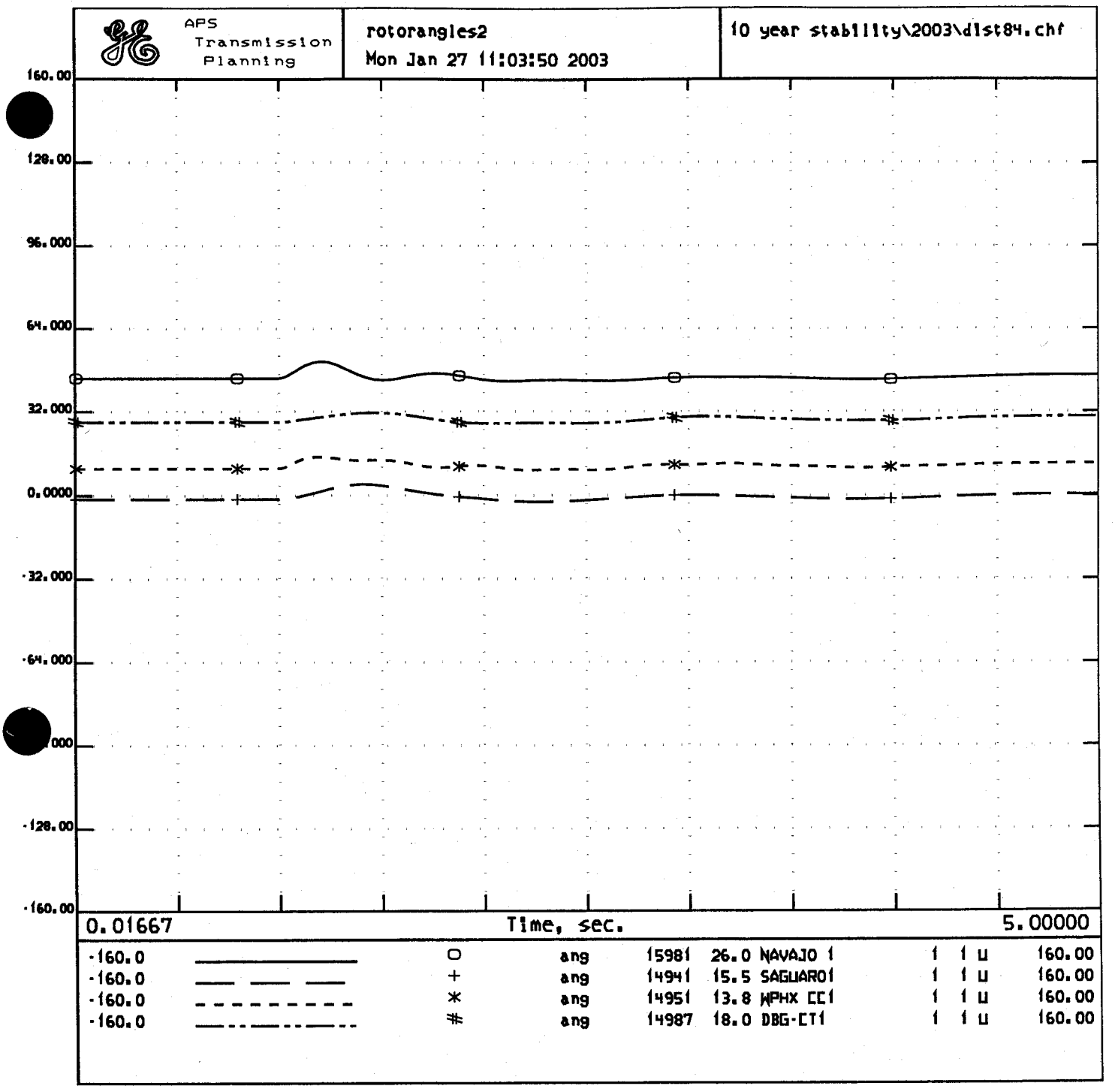
PERKINS FLT PERKINS-MEAD LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
PERK-MEAD STAB; 01/03; T=0 3P FLT PERK500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MKP/WWG;4C CLR FLT W/PERK-MEAD;8C REIN;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



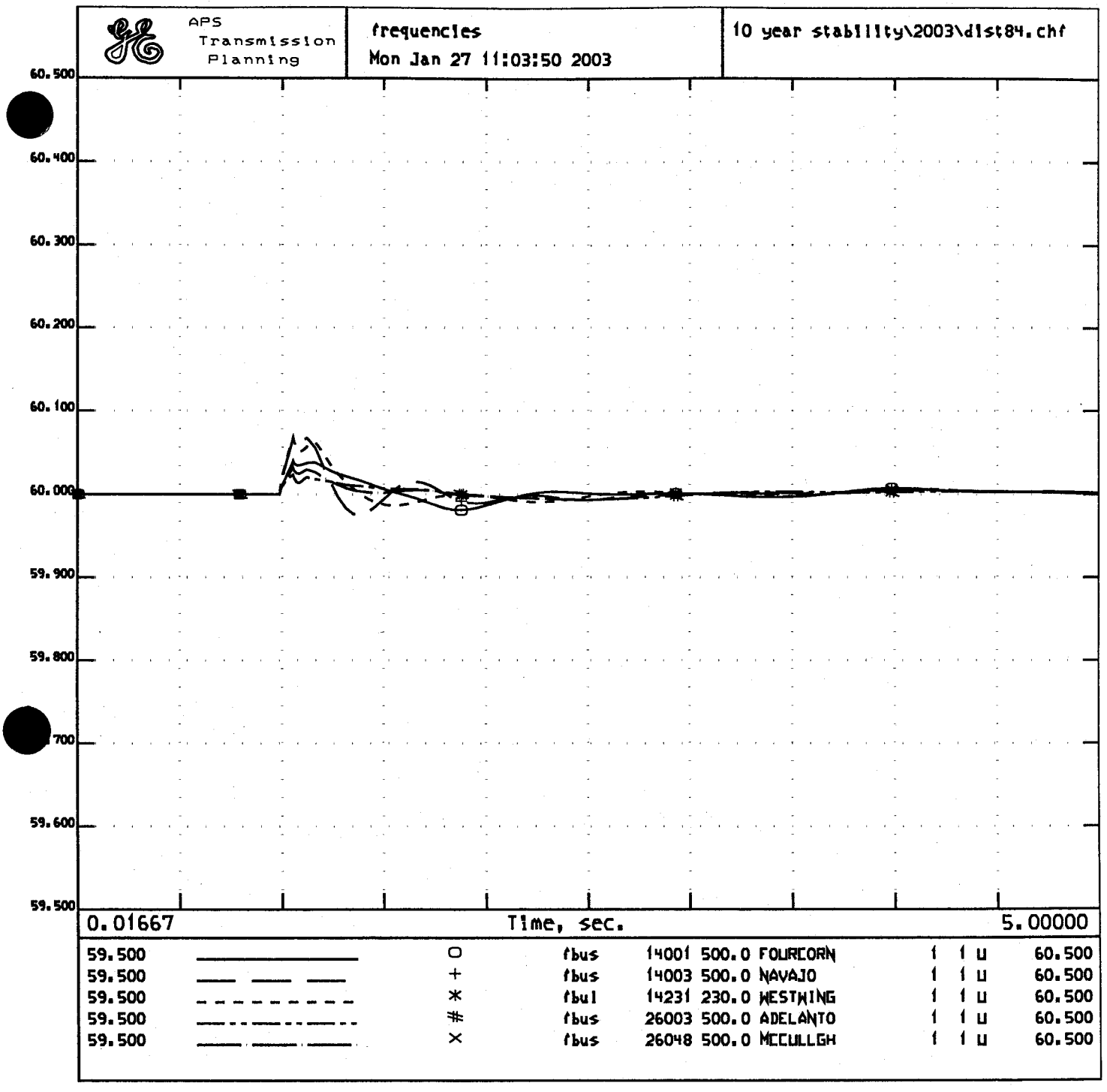
PERKINS FLT PERKINS-MEAD LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
PERK-MEAD STAB; 01/03; T=0 3P FLT PERK500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MKP/WWG;4C CLR FLT W/PERK-MEAD;8C REIN;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



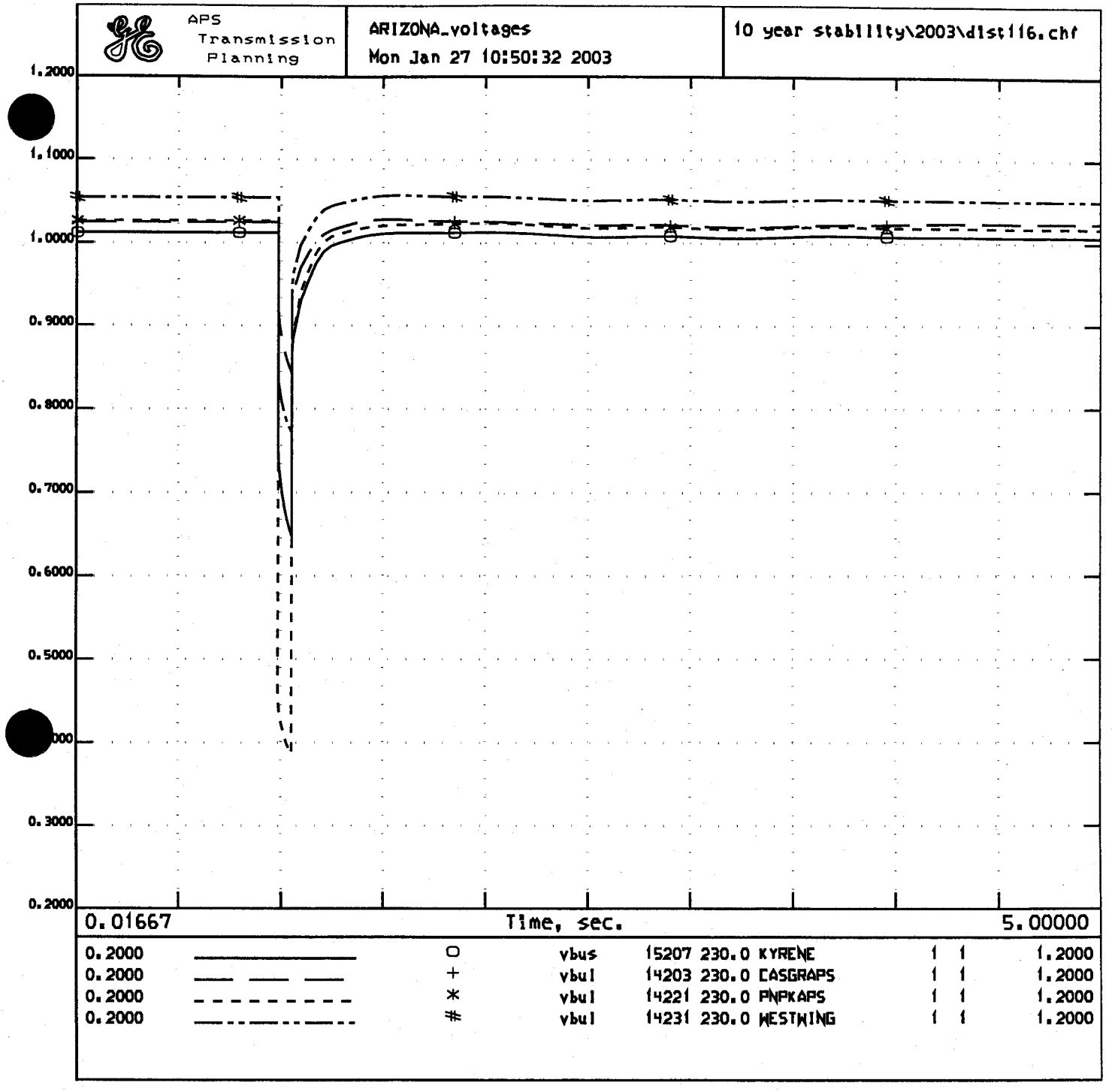
PERKINS FLT PERKINS-MEAD LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
PERK-MEAD STAB; 01/03; T=0 3P FLT PERK500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MKP/WWG;4C CLR FLT W/PERK-MEAD;8C REIN;2003.dyd;WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



PERKINS FLT PERKINS-MEAD LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
PERK-MEAD STAB; 01/03; T=0 3P FLT PERK500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MKP/WWG;4C CLR FLT W/PERK-MEAD;8C REIN;2003.dyd;WSCC.bat

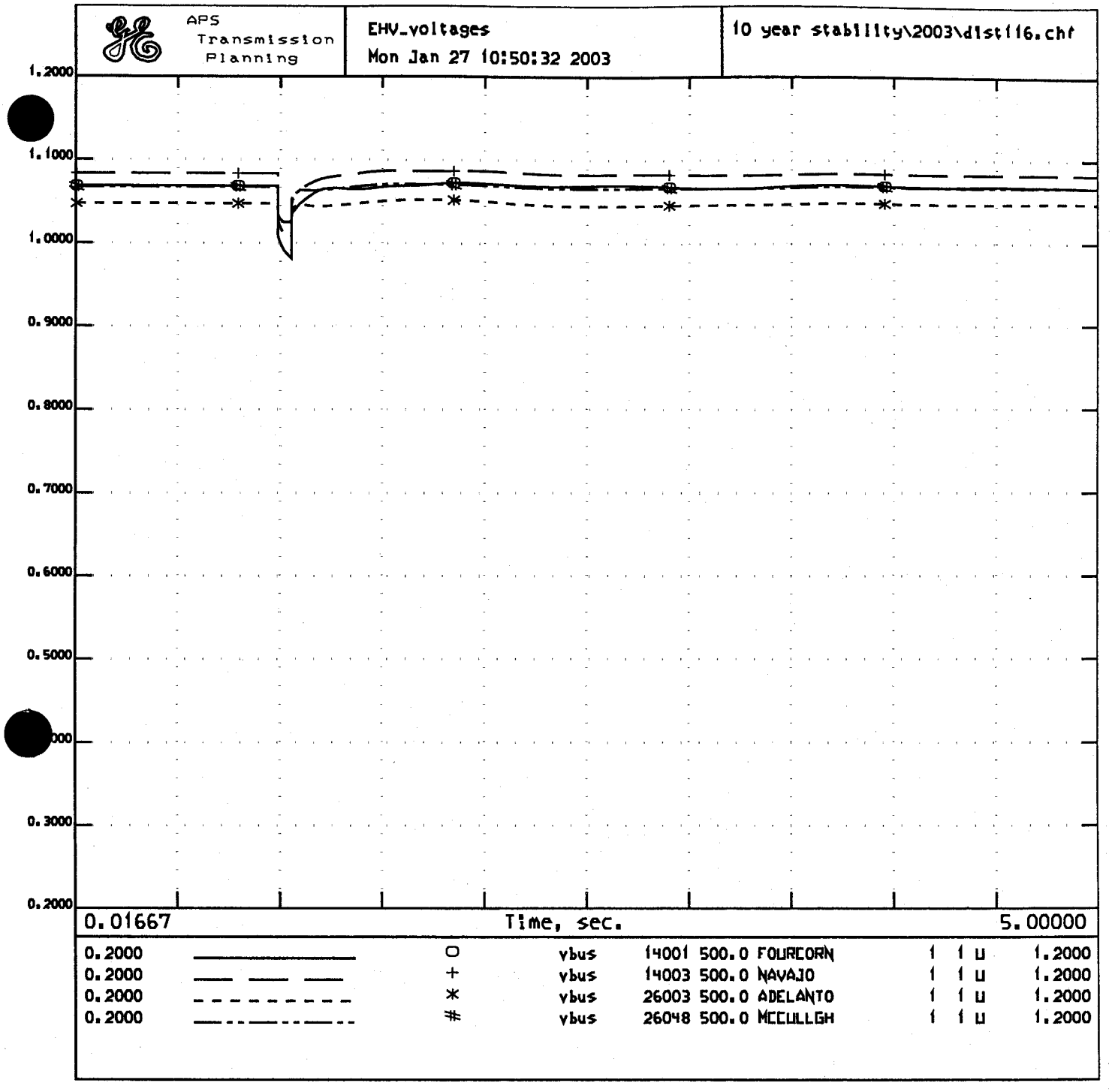
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



PNPK 345KV FLT PP-CH LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
PP-CH STAB #1; 01/03; T=0 3P FLT PP345;
4C CLR FLT W/PP-CH;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

B116



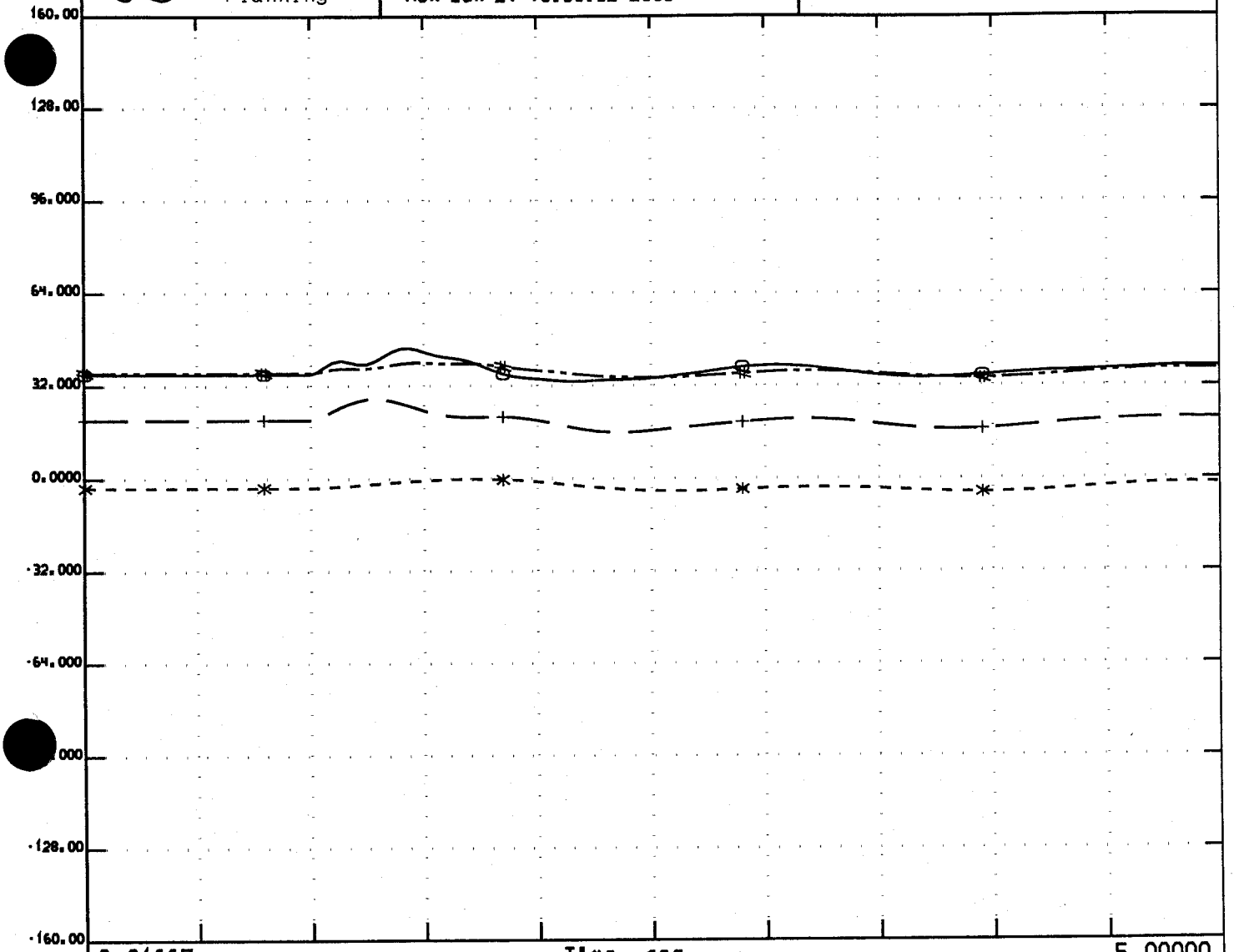
PNPK 345KV FLT PP-CH LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
PP-CH STAB ;1; 01/03; T=0 3P FLT PP345;
4C CLR FLT W/PP-CH;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

APS Transmission Planning

rotorangles1
Mon Jan 27 10:50:32 2003

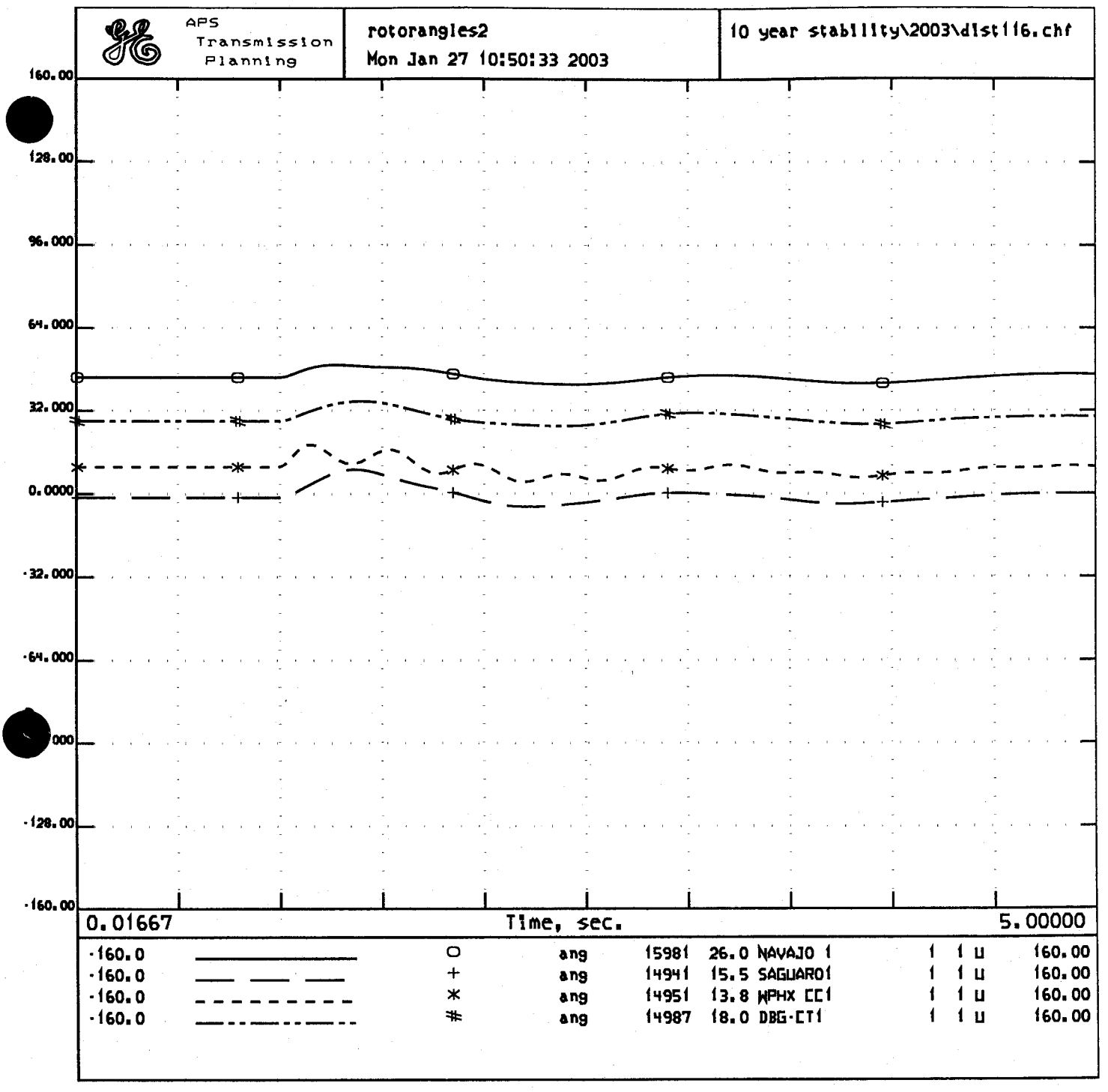
10 year stability\2003\dist116.chf



-160.0	———	O	ang	14914	22.0	FCNGN4CC	H	1	U	160.00
-160.0	— — —	+	ang	14931	24.0	PALOVRD1	1	1	U	160.00
-160.0	- - - - -	*	ang	24005	20.0	ALAMT5 G	H	1	U	160.00
-160.0	—-—-—	#	ang	24095	22.0	MOHAVICC	H	1	U	160.00

PNPK 345KV FLT PP-CH LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
PP-CH STAB #1; 01/03; T=0 3P FLT PP345;
4C CLR FLT W/PP-CH;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



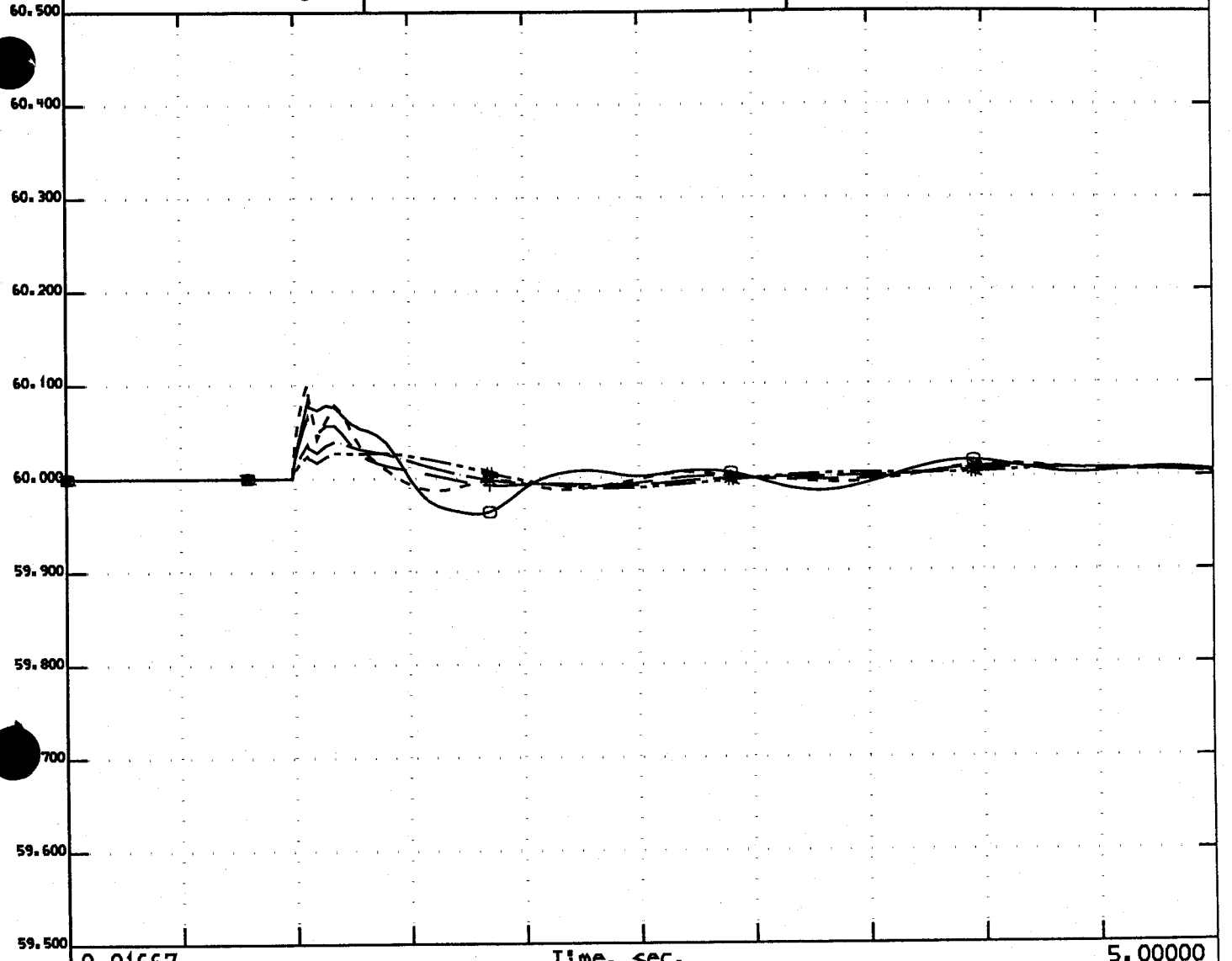
PNPK 345KV FLT PP-CH LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
PP-CH STAB #1; 01/03; T=0 3P FLT PP345;
4C CLR FLT W/PP-CH;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

APS Transmission Planning

frequencies
Mon Jan 27 10:50:33 2003

10 year stability\2003\dist116.chf

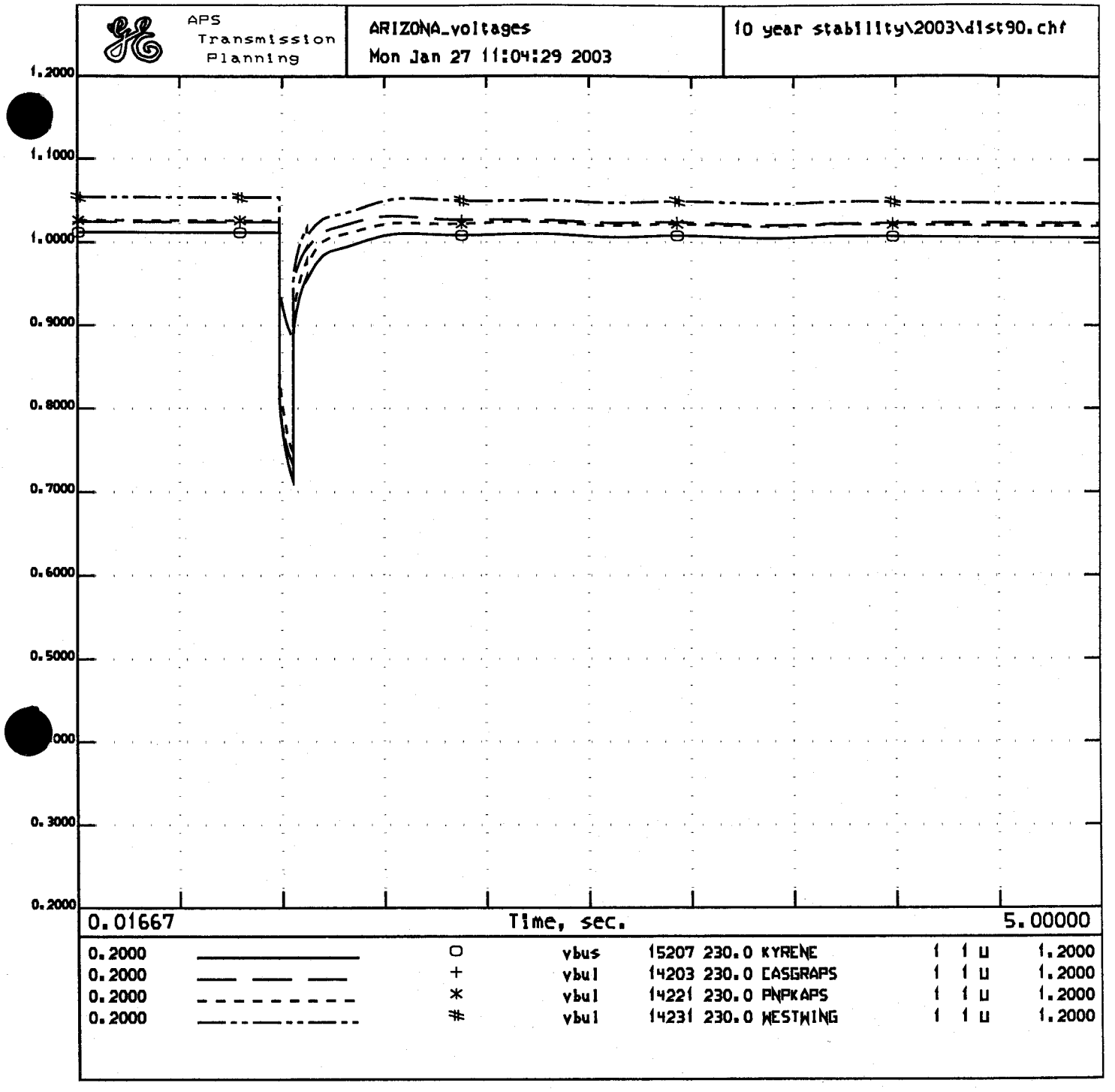


59.500	———	O	fbus	14001 500.0 FOURCORN	1	1	u	60.500
59.500	— — —	+	fbus	14003 500.0 NAVAJO	1	1	u	60.500
59.500	- - - - - - - - -	*	fbul	14231 230.0 WESTWING	1	1	u	60.500
59.500	—-—-—--	#	fbus	26003 500.0 ADELANTO	1	1	u	60.500
59.500	—— —— ——	×	fbus	26048 500.0 MCCULLGH	1	1	u	60.500

PNPK 345KV FLT PP-CH LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
PP-CH STAB #1; 01/03; T=0 3P FLT PP345;
4C CLR FLT W/PP-CH;2003.dyd;WSCC.bpt

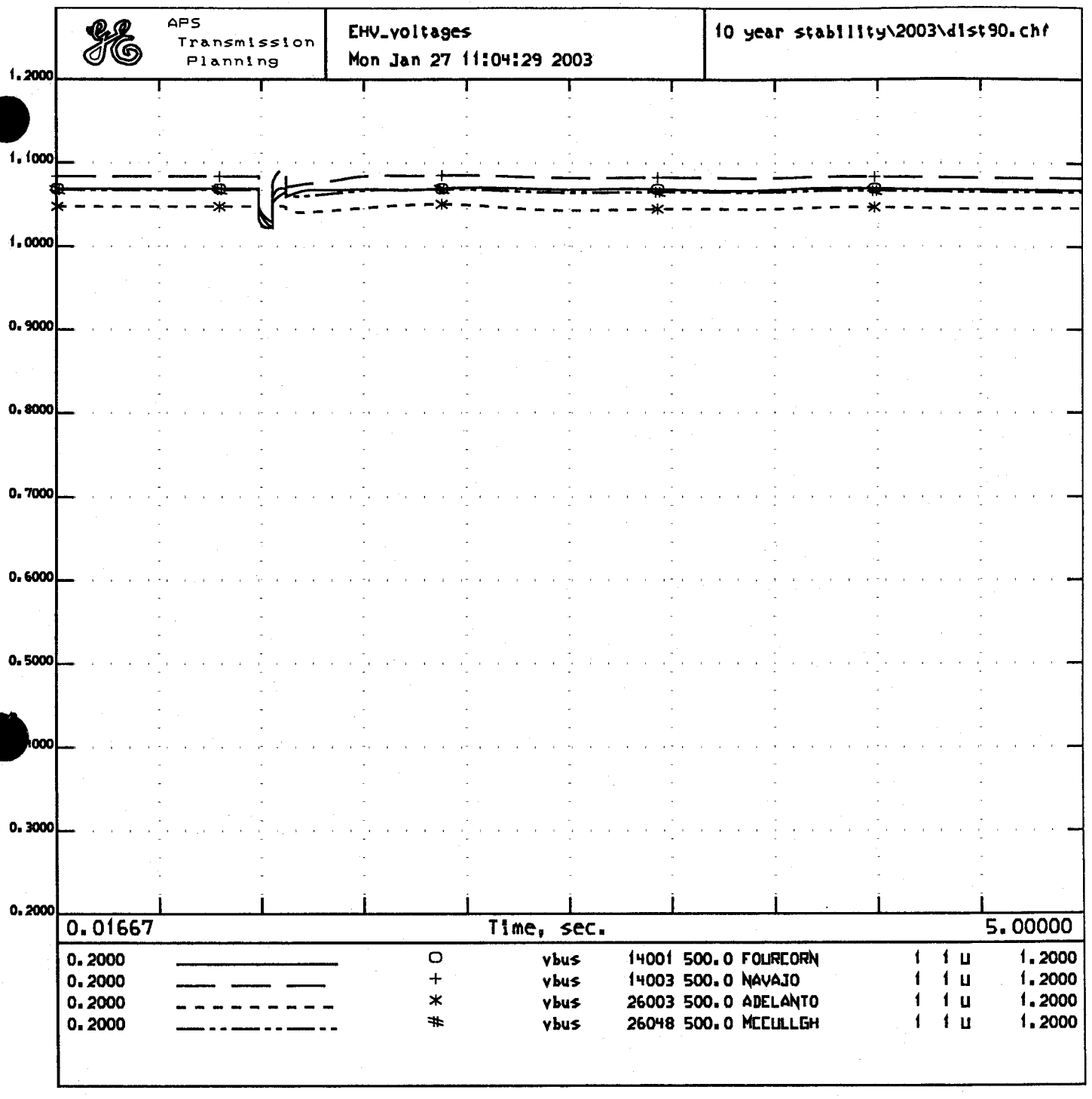
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

B120



RUDD FLT PV-RUDD LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
PV-RUDD STAB .1; 01/03; T=0 3P FLT RUDD500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-RUDD;8C REIN;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



RUDD FLT PV-RUDD LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
PV-RUDD STAB .1; 01/03; T=0 3P FLT RUDD500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-RUDD;8C REIN;2003.dyd;WSCC.bpt

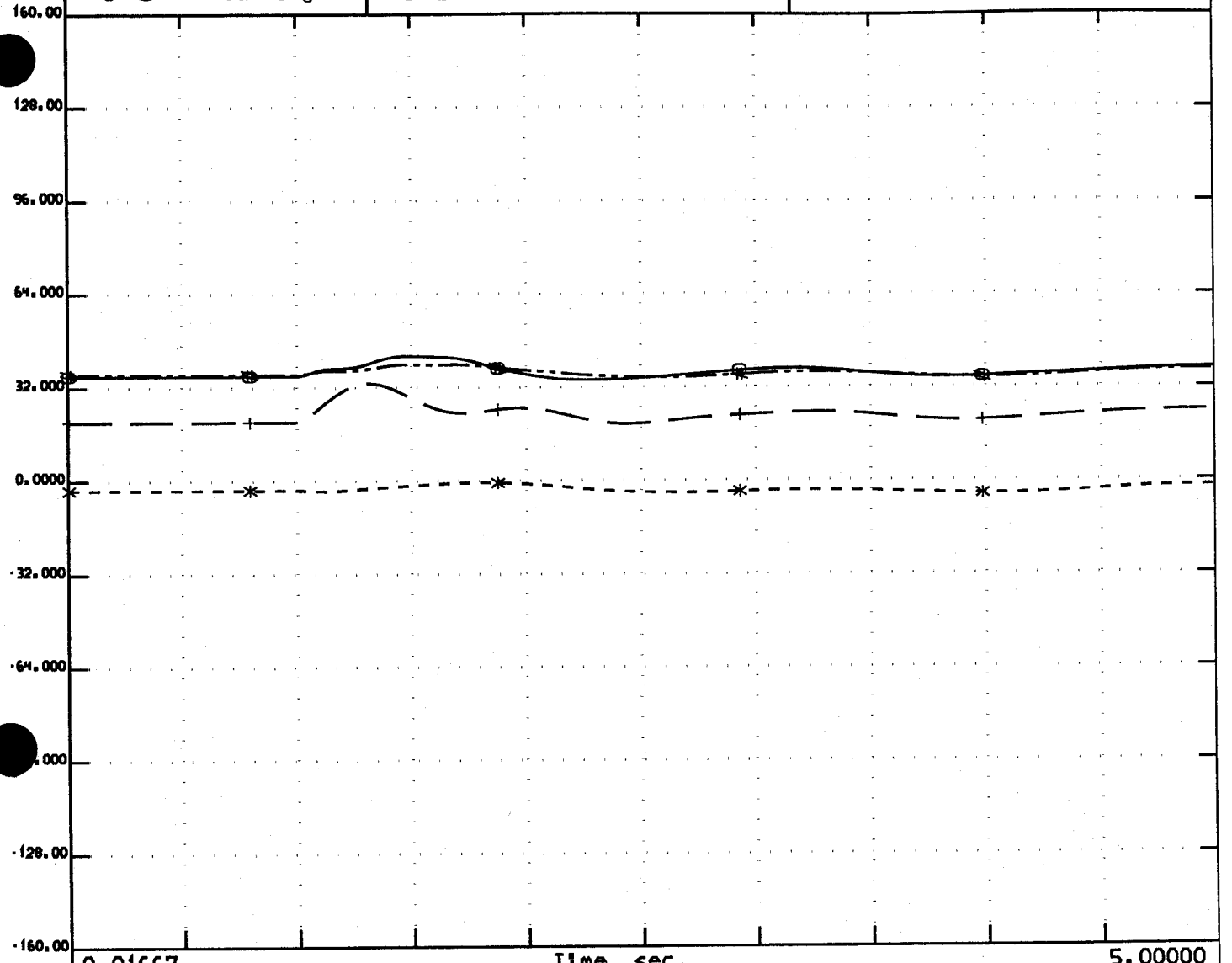
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

APS Transmission Planning

rotorangles1

Mon Jan 27 11:04:29 2003

10 year stability\2003\dist90.chf



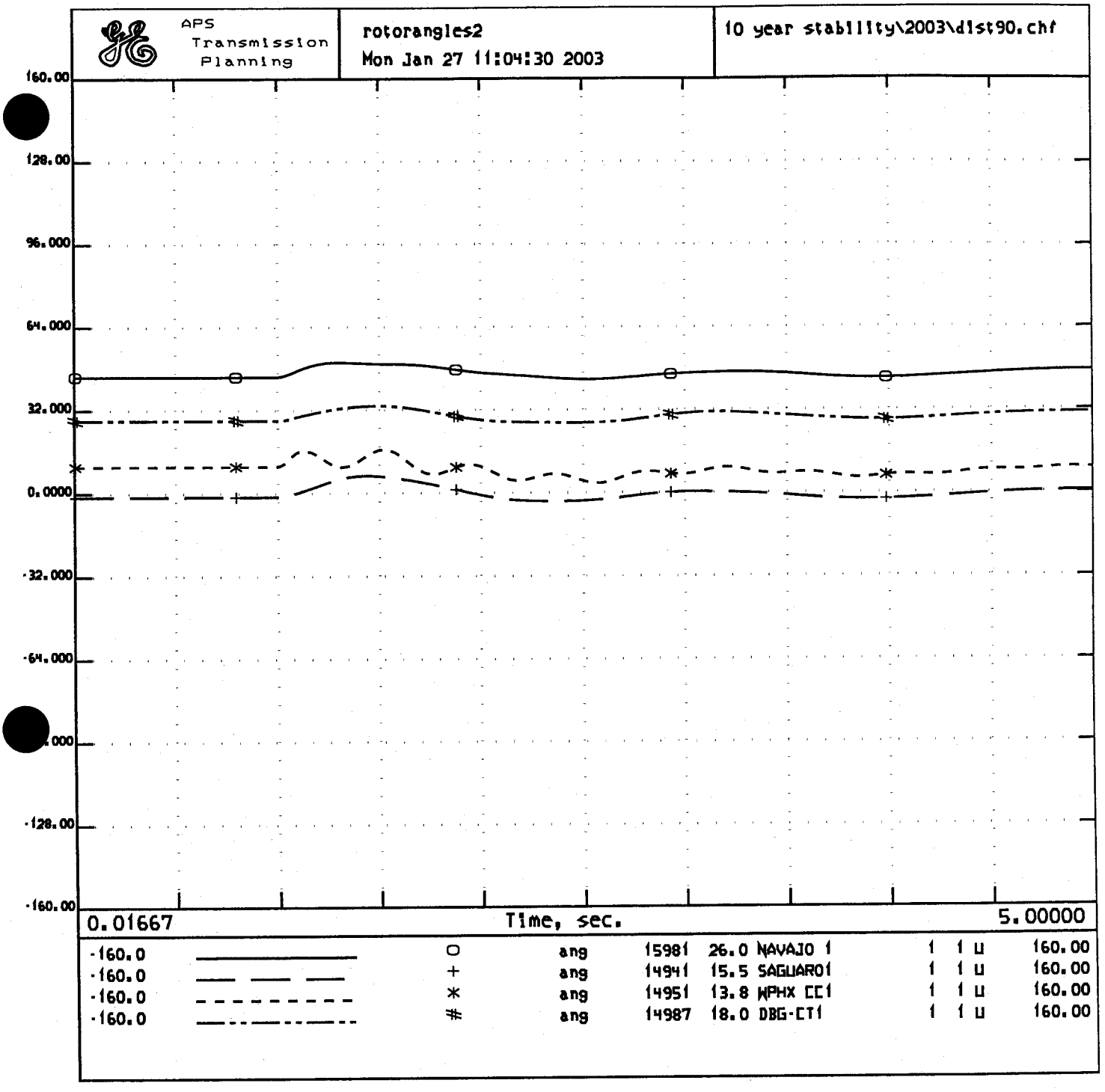
0.01667 Time, sec. 5.00000

-160.0	———	O	ang	14914	22.0 FCNGN4CC	H	1	U	160.00
-160.0	— — —	+	ang	14931	24.0 PALOVRD1	1	1	U	160.00
-160.0	- - - - -	*	ang	24005	20.0 ALAMT5 G	H	1	U	160.00
-160.0	—-—-—	#	ang	24095	22.0 MOHAV1CC	H	1	U	160.00

RUDD FLT PV-RUDD LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
PV-RUDD STAB #1; 01/03; T=0 3P FLT RUDD500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-RUDD;8C REIN;2003.dyd;WSCC.bpt

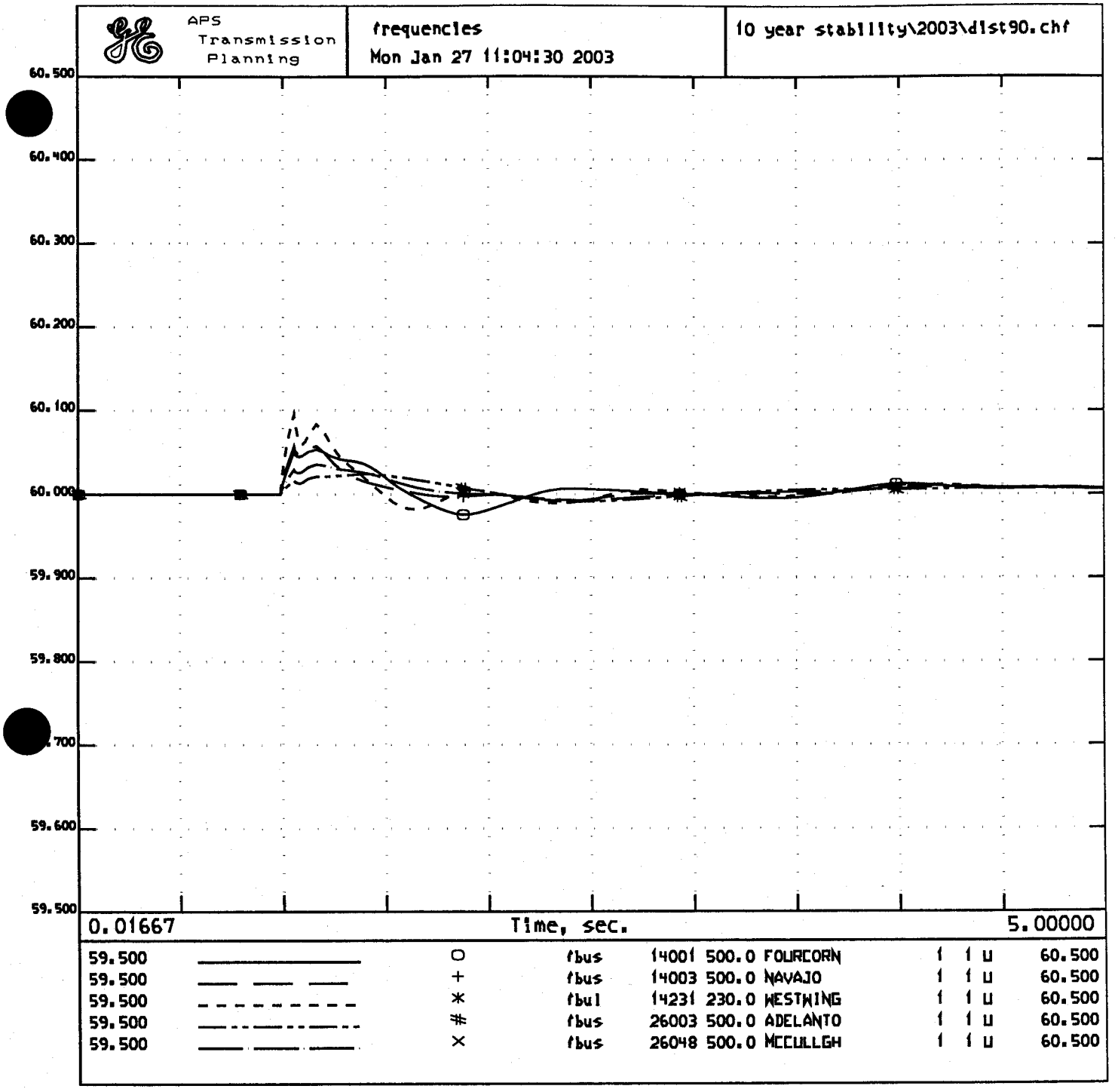
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

B123



RUDD FLT PV-RUDD LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
PV-RUDD STAB .1; 01/03; T=0 3P FLT RUDD500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-RUDD;8C REIN;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



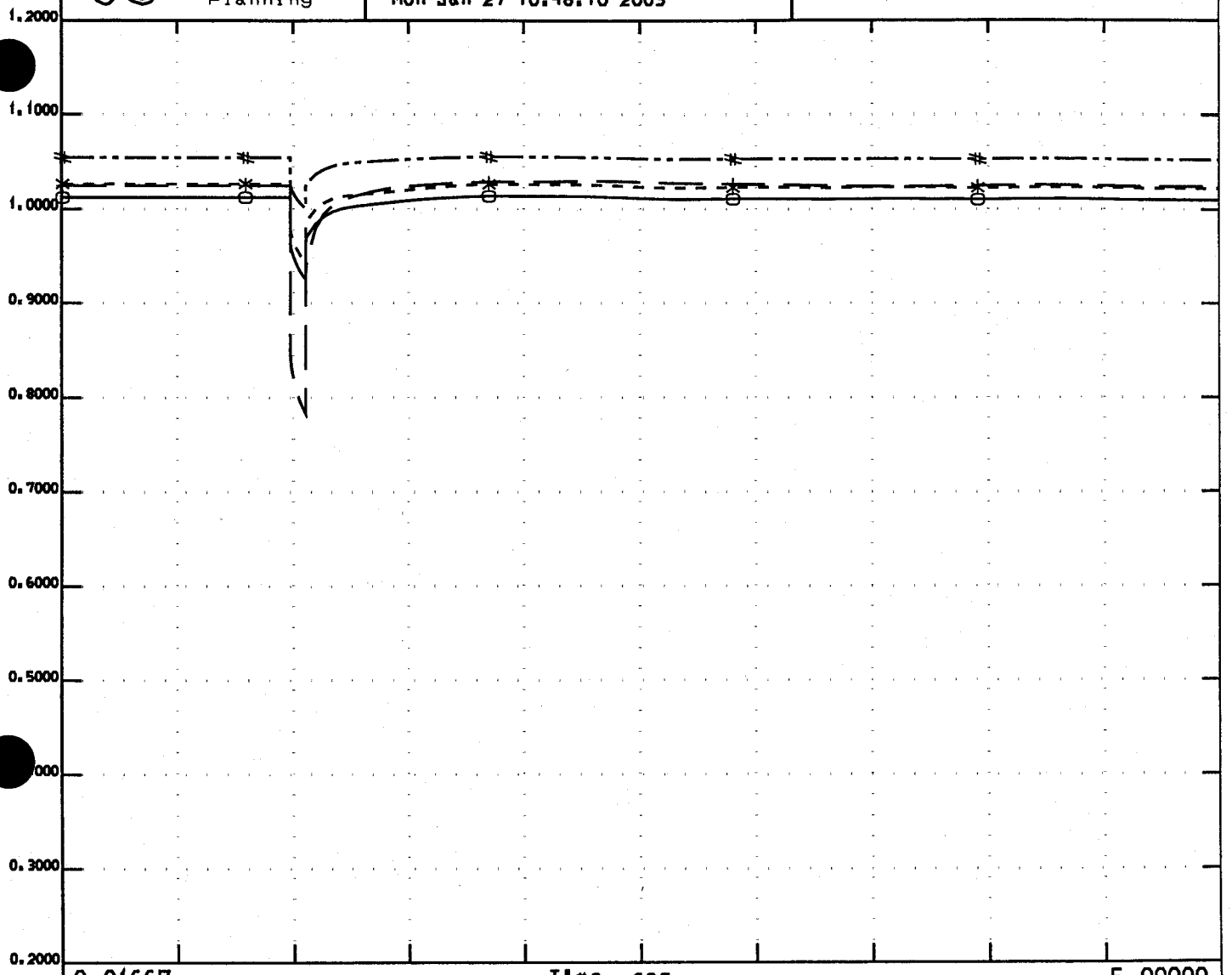
RUDD FLT PV-RUDD LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
PV-RUDD STAB ;1; 01/03; T=0 3P FLT RUDD500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-RUDD;8C REIN;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

APS Transmission Planning

ARIZONA_voltages
Mon Jan 27 10:48:10 2003

10 year stability\2003\dist115.chf



0.01667 Time, sec. 5.00000

0.2000	————	o	vbus	15207 230.0 KYRENE	1	1	u	1.2000
0.2000	— — —	+	vbul	14203 230.0 CASGRAPS	1	1	u	1.2000
0.2000	- - - - - - - - -	*	vbul	14221 230.0 PNPKAPS	1	1	u	1.2000
0.2000	—-—-—-	#	vbul	14231 230.0 WESTWING	1	1	u	1.2000

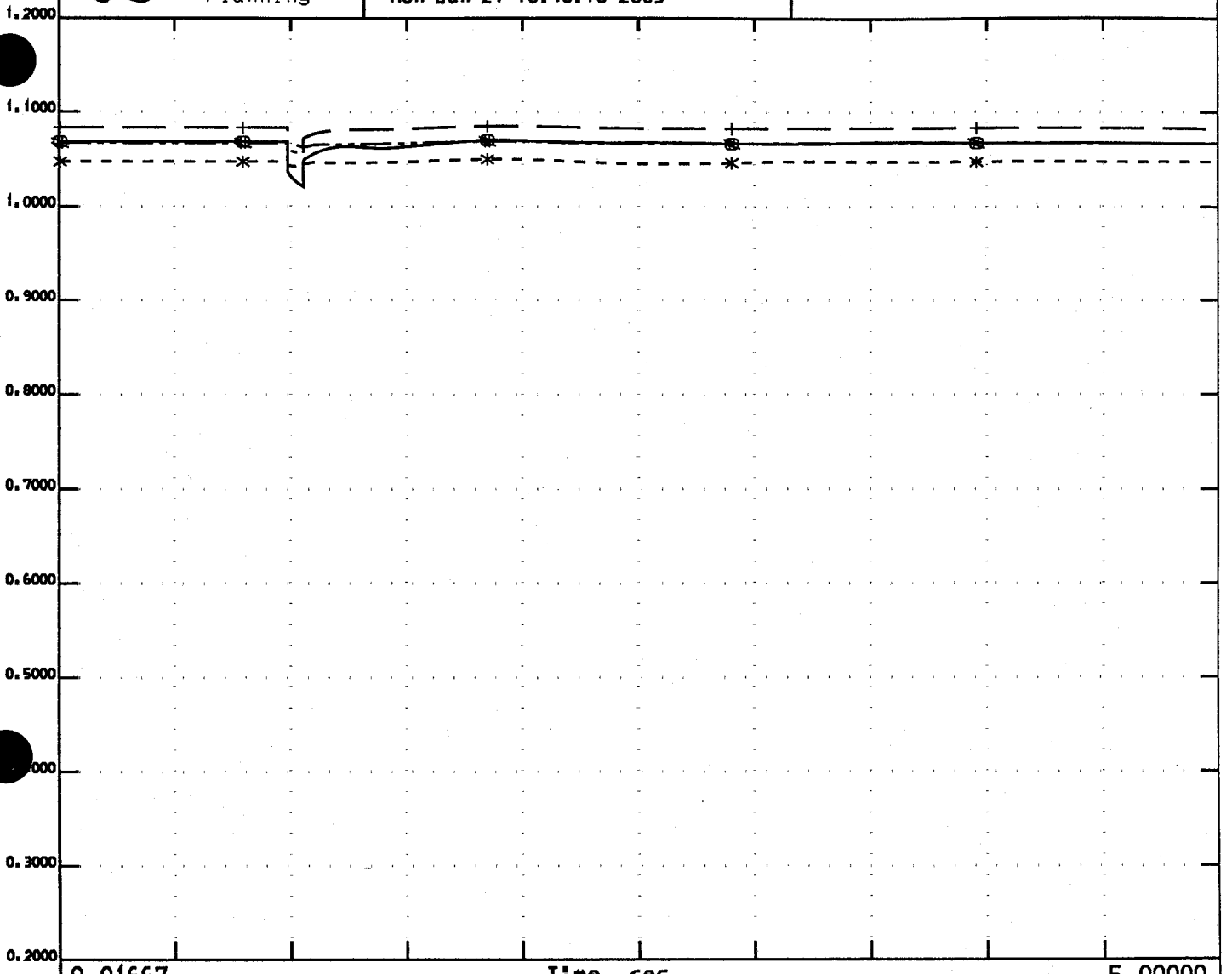
SAGUARO FLT SAG-CH LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
SAG-CH STAB #1; 01/03; T=0 3P FLT SAG500;
4C CLR FLT W/SAG-CH;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

APS Transmission Planning

EHV_voltages
Mon Jan 27 10:48:10 2003

10 year stability\2003\dist115.chf



0.01667 Time, sec. 5.00000

0.2000	————	o	vbus	14001	500.0	FOURCORN	1	1 u	1.2000
0.2000	— — —	+	vbus	14003	500.0	NAVAJO	1	1 u	1.2000
0.2000	- - - - - -	*	vbus	26003	500.0	ADELANTO	1	1 u	1.2000
0.2000	—-—-—	#	vbus	26048	500.0	MCCULLGH	1	1 u	1.2000

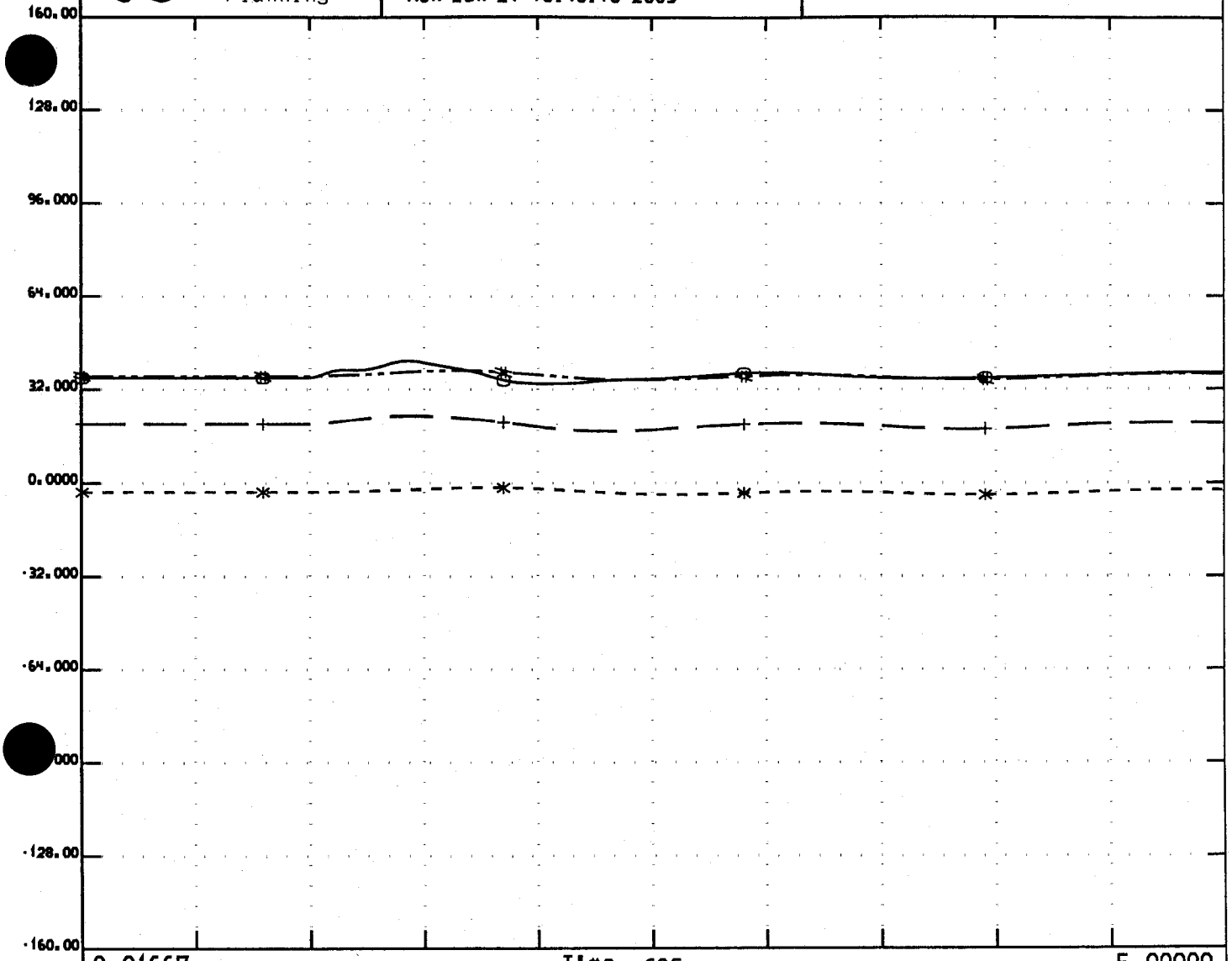
SAGUARO FLT SAG-CH LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
SAG-CH STAB #1; 01/03; T=0 3P FLT SAG500;
4C CLR FLT W/SAG-CH;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

APS Transmission Planning

rotorangles1
Mon Jan 27 10:48:10 2003

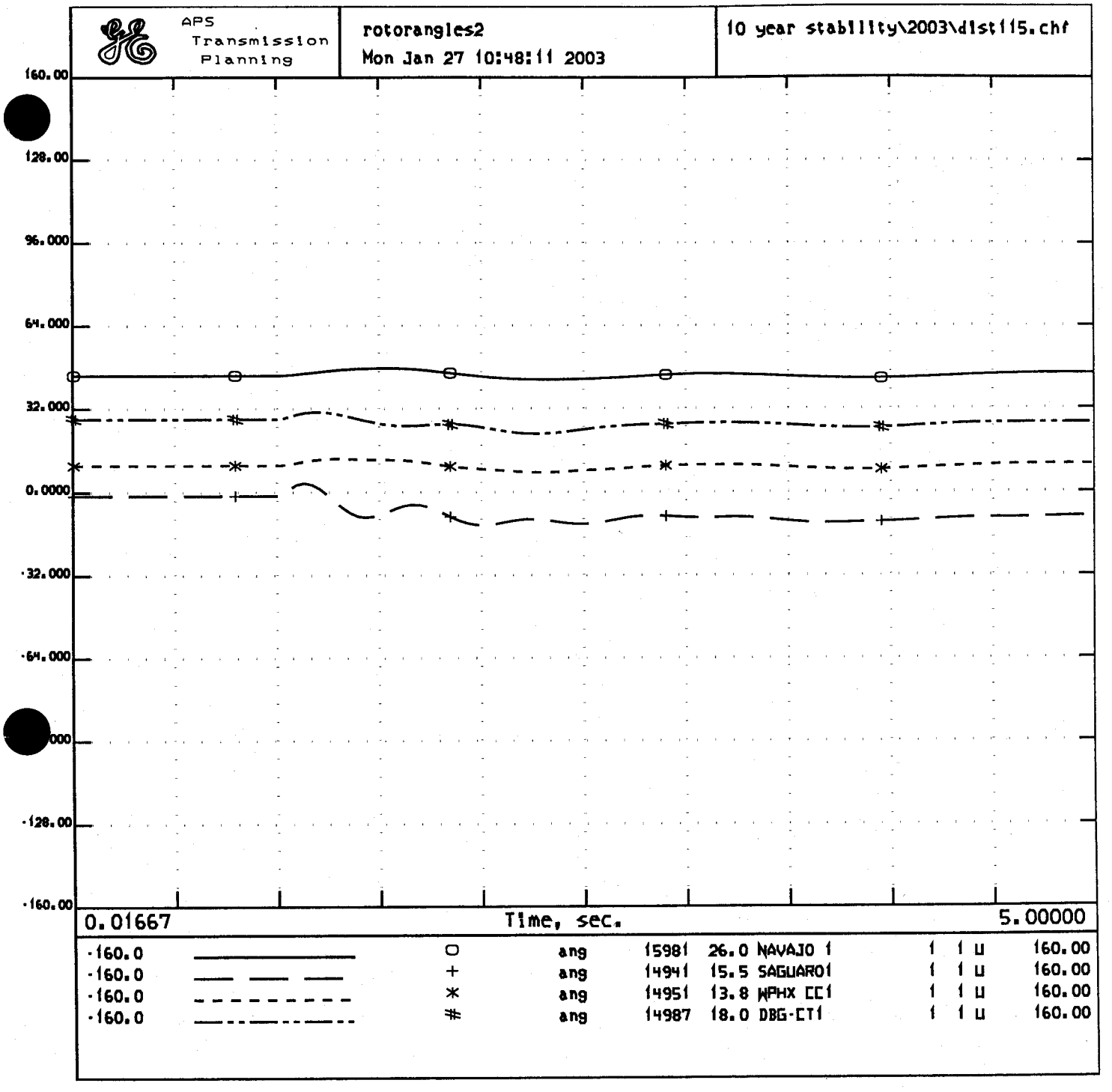
10 year stability\2003\dist115.chf



-160.0	————————	o	ang	14914	22.0	FCNGN4CC	H	1	u	160.00
-160.0	— — —	+	ang	14931	24.0	PALOVRD1	1	1	u	160.00
-160.0	- - - - - - - - -	*	ang	24005	20.0	ALAMT5 G	H	1	u	160.00
-160.0	—-·—-·—-·	#	ang	24095	22.0	MOHAV1CC	H	1	u	160.00

SAGUARO FLT SAG-CH LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
SAG-CH STAB #1; 01/03; T=0 3P FLT SAG500;
4C CLR FLT W/SAG-CH;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



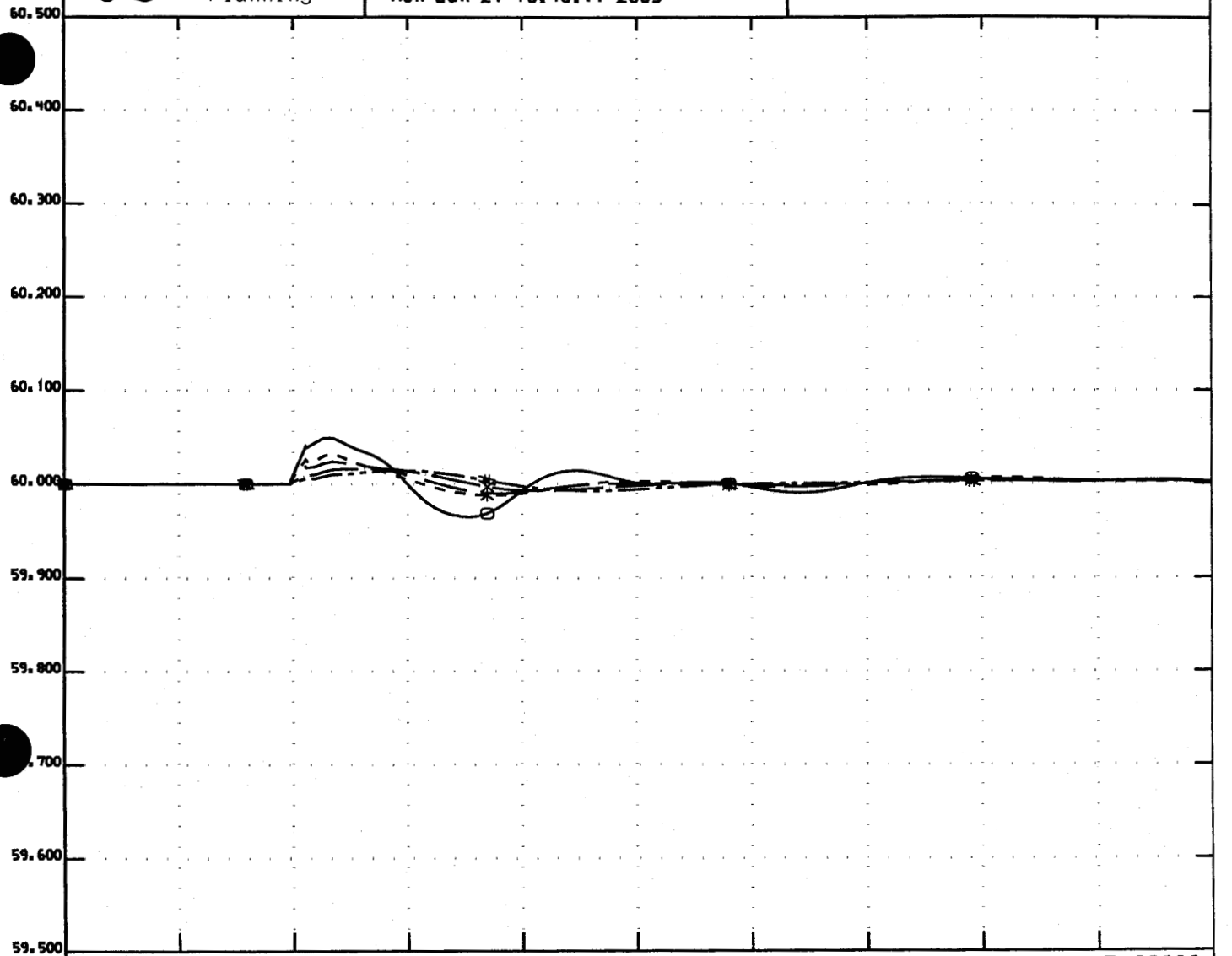
SAGUARO FLT SAG-CH LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
SAG-CH STAB #1; 01/03; T=0 3P FLT SAG500;
4C CLR FLT W/SAG-CH;2003.dyd;WSCC.bpt

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

APS Transmission Planning

frequencies
Mon Jan 27 10:48:11 2003

10 year stability\2003\dist115.chf

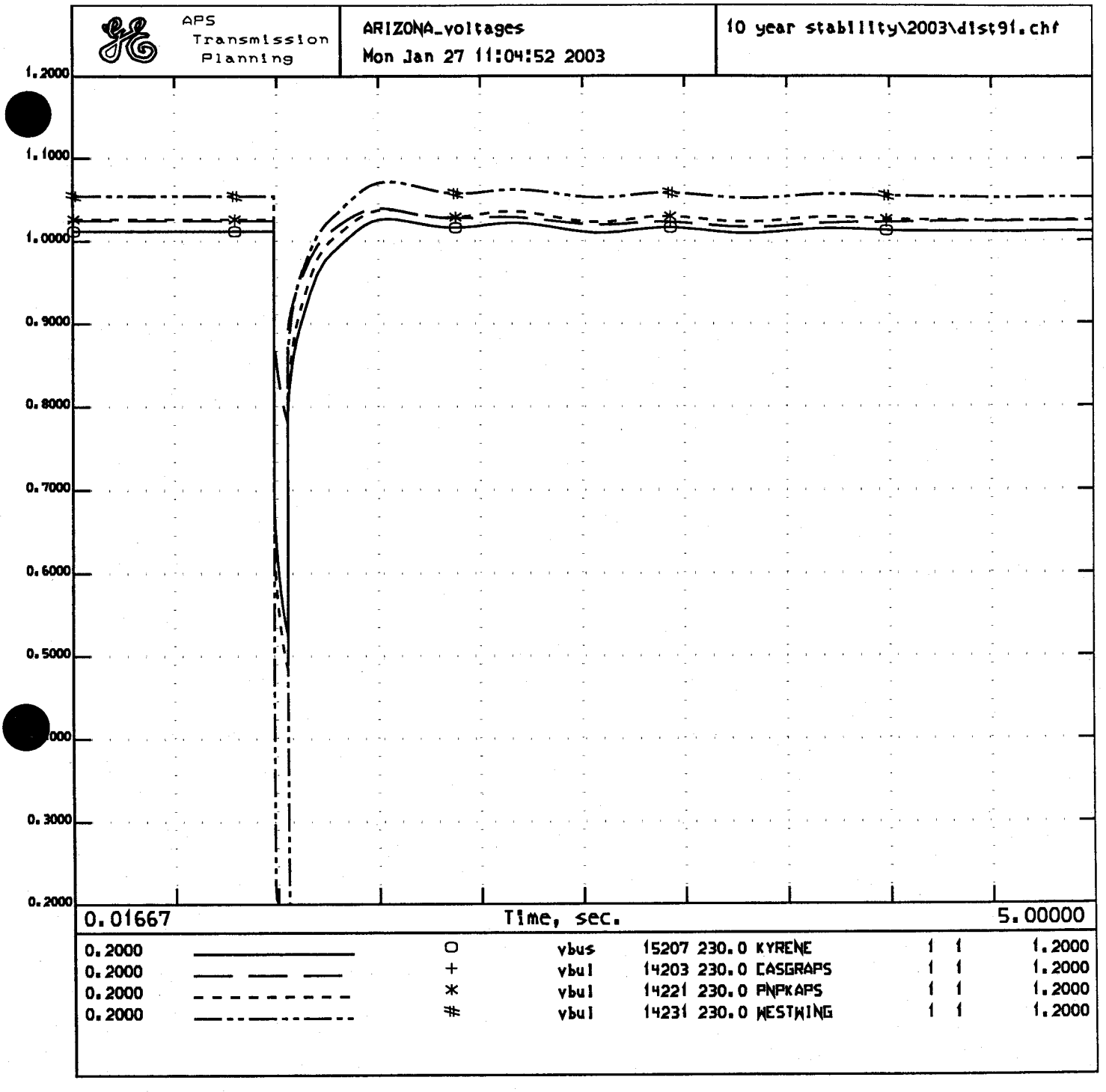


59.500	————	○	fbus	14001	500.0	FOURCORN	1	1 u	60.500
59.500	— — —	+	fbus	14003	500.0	NAVAJO	1	1 u	60.500
59.500	- - - - - - - -	*	fbul	14231	230.0	WESTWING	1	1 u	60.500
59.500	— - - — - - — - -	#	fbus	26003	500.0	ADELANTO	1	1 u	60.500
59.500	— . — . —	×	fbus	26048	500.0	MCCULLGH	1	1 u	60.500

SAGUARO FLT SAG-CH LINE OUT
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
SAG-CH STAB .1; 01/03; T=0 3P FLT SAG500;
4C CLR FLT W/SAG-CH;2003.dyd;WSCC.bpt

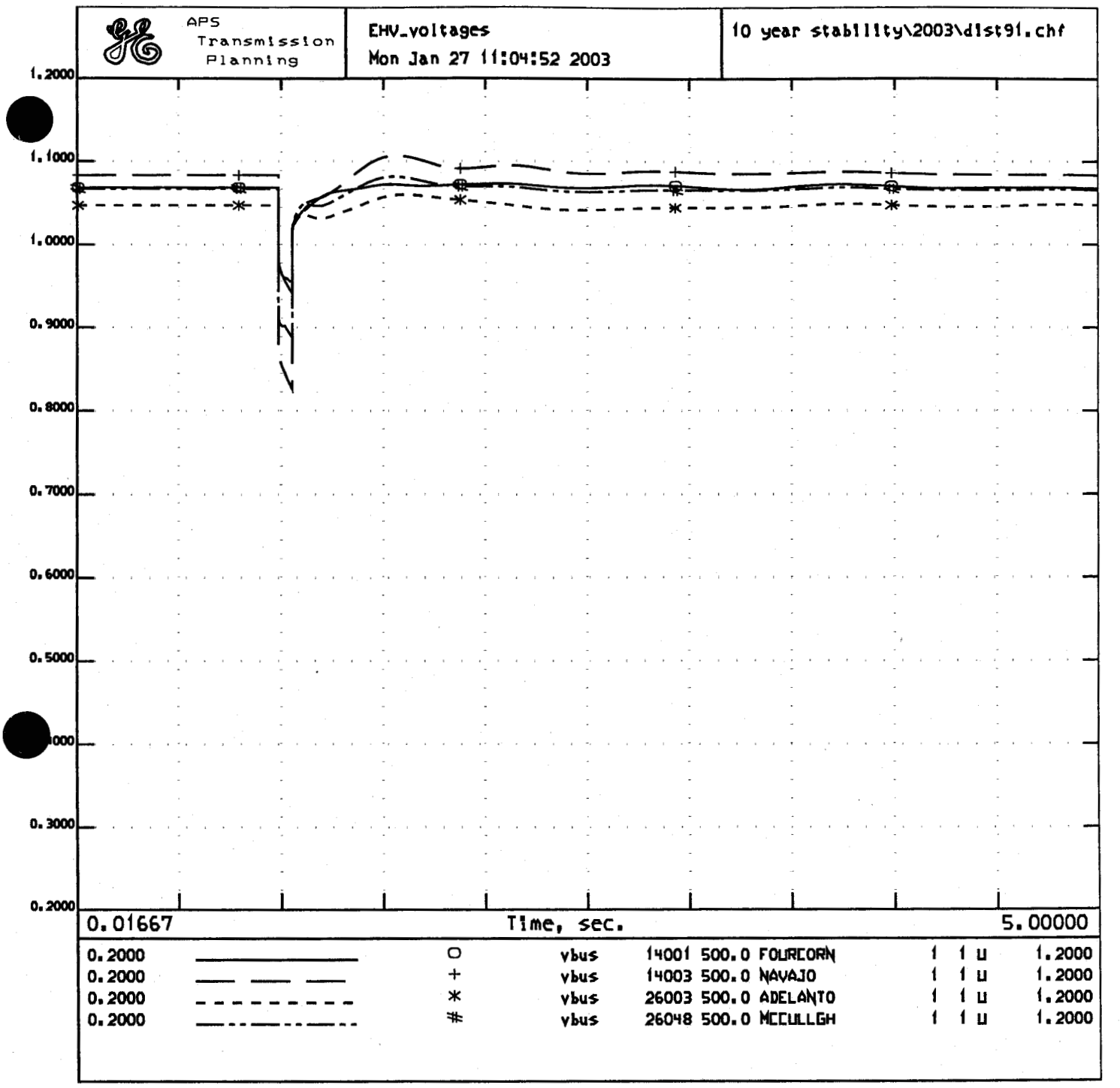
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

B130



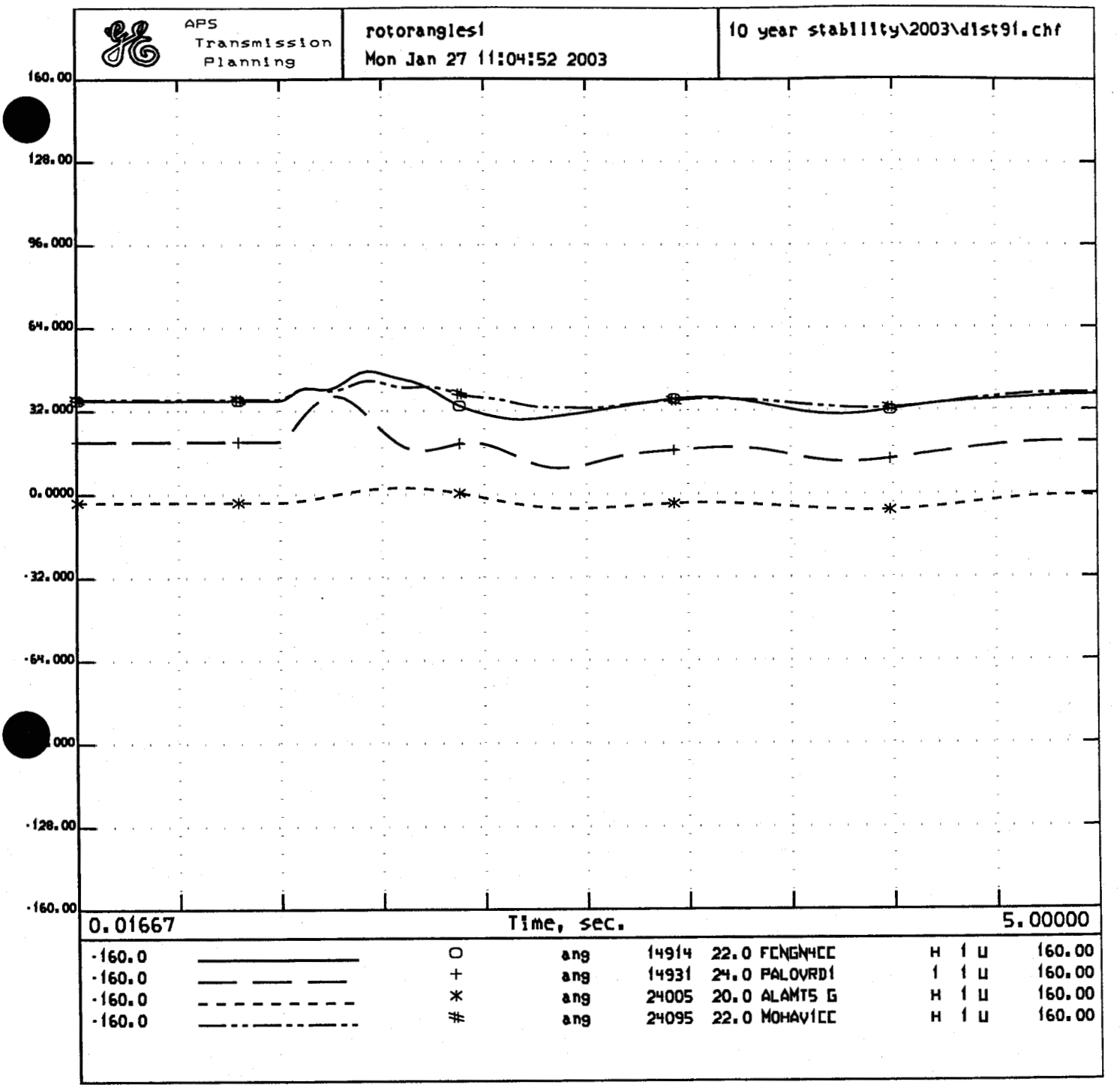
WESTERN SYSTEMS COORDINATING COUNCIL
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
WWG-NAV STAB; 1/03; T=0 3P FLT WWG500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MKP/WWG;4C CLR FLT W/WWG-NAV;8C REIN;2003.dyd WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



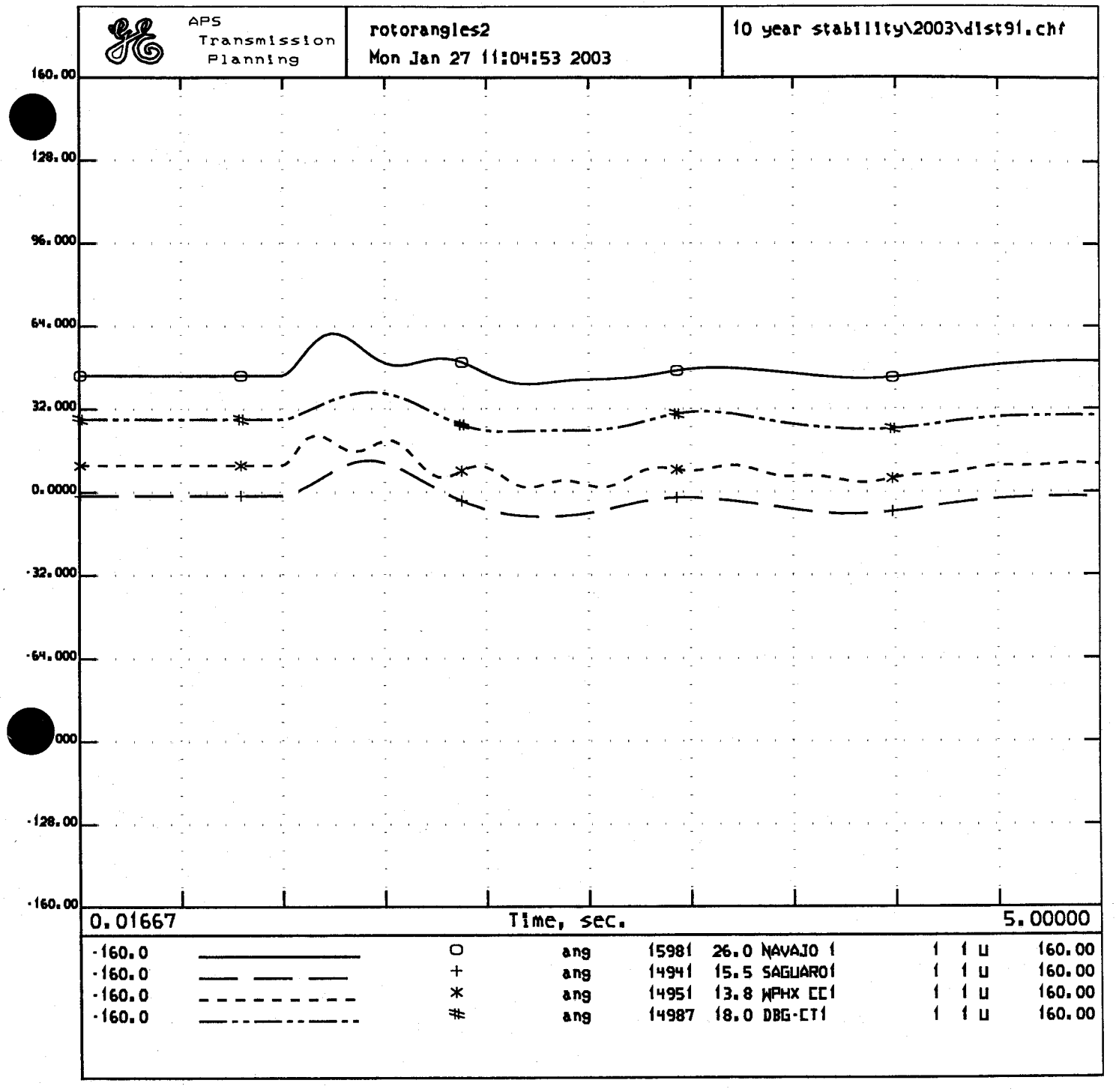
WESTERN SYSTEMS COORDINATING COUNCIL
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
WWG-NAV STAB; 1/03; T=0 3P FLT WWG500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MKP/WWG;4C CLR FLT W/WWG-NAV;8C REIN;2003.dyd WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



WESTERN SYSTEMS COORDINATING COUNCIL
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
WWG-NAV STAB; 1/03; T=0 3P FLT WWG500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MKP/WWG;4C CLR FLT W/WWG-NAV;8C REIN;2003.dyd WSCC.bat

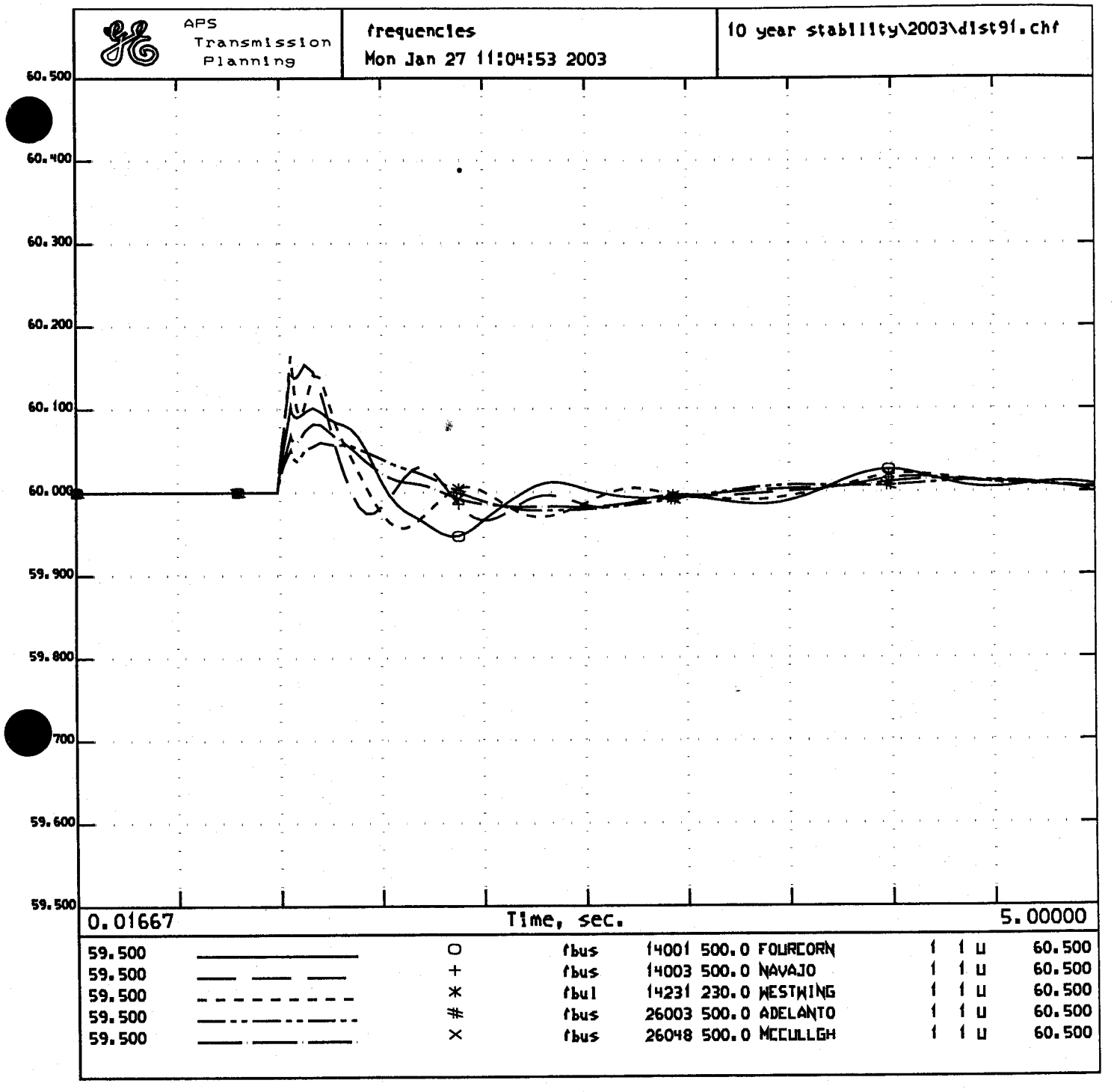
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



WESTERN SYSTEMS COORDINATING COUNCIL
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
WWG-NAV STAB; 1/03; T=0 3P FLT WWG500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MKP/WWG;4C CLR FLT W/WWG-NAV;8C REIN;2003.dyd WSCC.bat

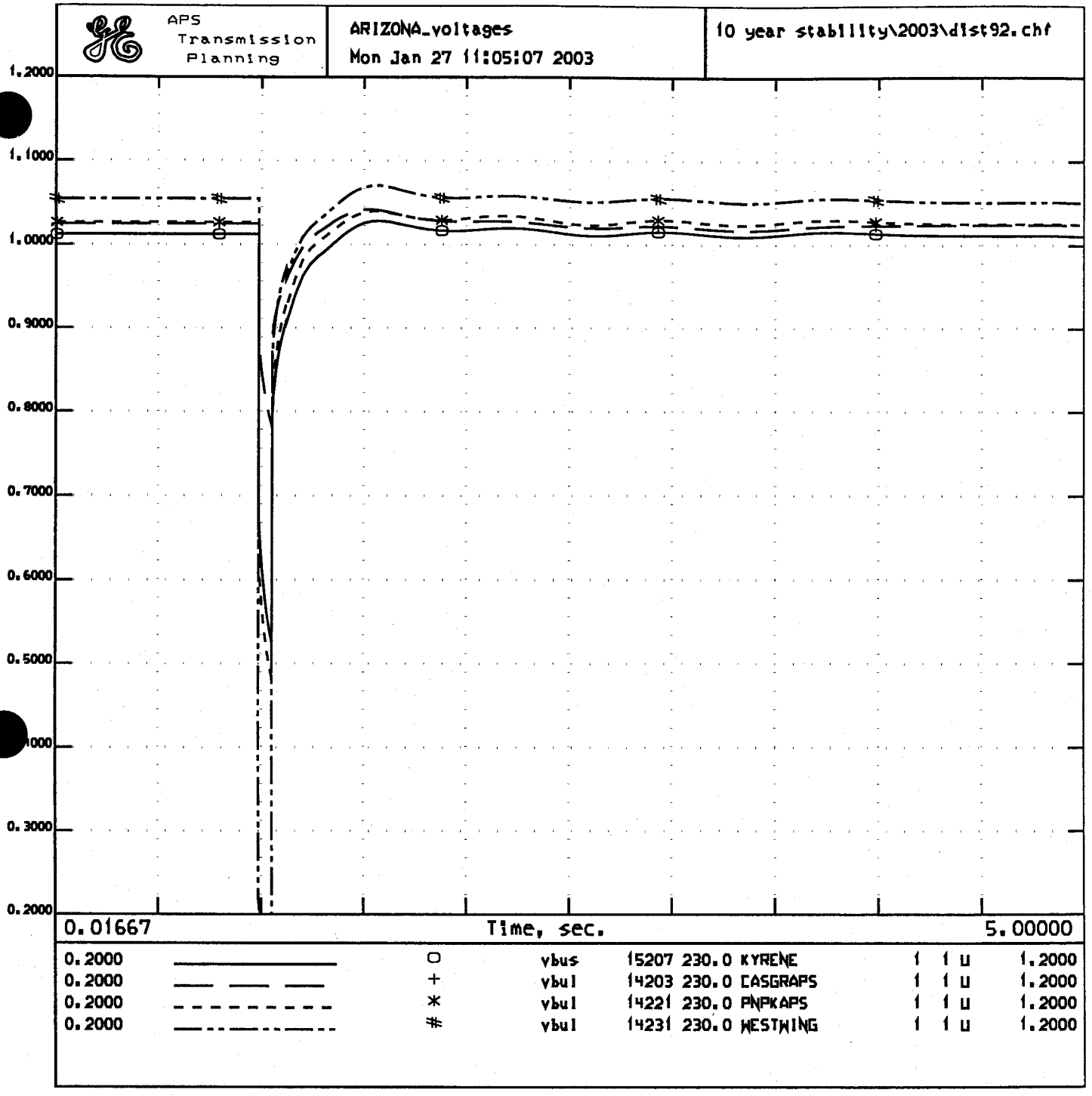
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

B134



WESTERN SYSTEMS COORDINATING COUNCIL
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
WWG-NAV STAB; 1/03; T=0 3P FLT WWG500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MKP/WWG;4C CLR FLT W/WWG-NAV;8C REIN;2003.dyd WSCC.bat

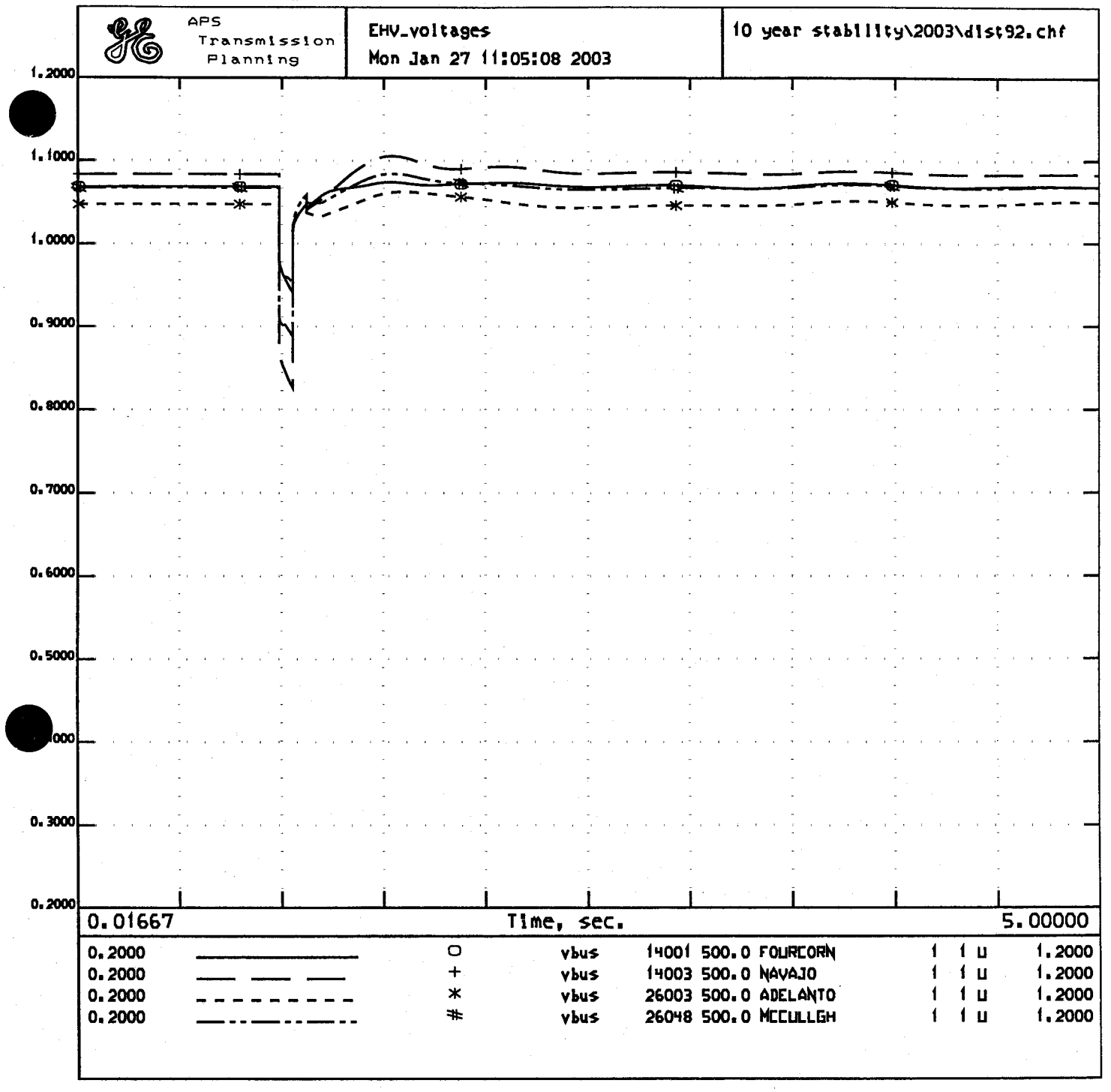
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



WESTERN SYSTEMS COORDINATING COUNCIL
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
WWG-YAV STAB; 1/03; T=0 3P FLT WWG500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MKP/WWG;4C CLR FLT W/WWG-PAL;8C REIN;2003.dyd WSCC.bat

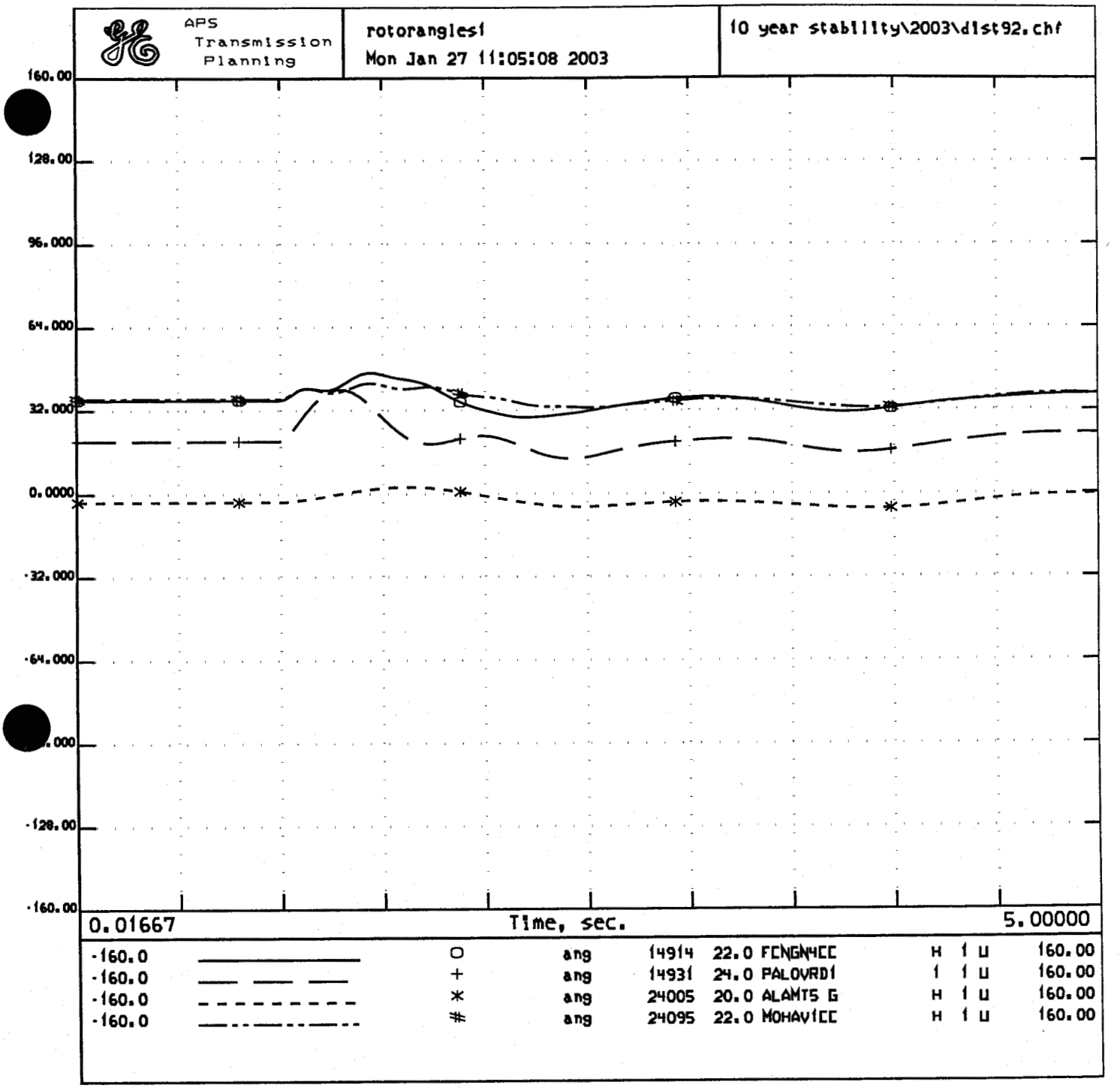
ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.

B136



WESTERN SYSTEMS COORDINATING COUNCIL
2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
WWG-YAV STAB; 1/03; T=0 3P FLT WWG500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MKP/WWG;4C CLR FLT W/WWG-PAL;8C REIN;2003.dyd WSCC.bat

ALL TSS COMMENTS INCLUDED.
MOST RECENT VERSION OF MASTER DYNAMICS FILE USED.



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2003 HS3-SA APPROVED BASE CASE
OCTOBER 29, 2001
WWG-YAV STAB; 1/03; T=0 3P FLT WWG500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MKP/WWG;4C CLR FLT W/WWG-PAL;8C REIN;2003.dyd WSCC.bat

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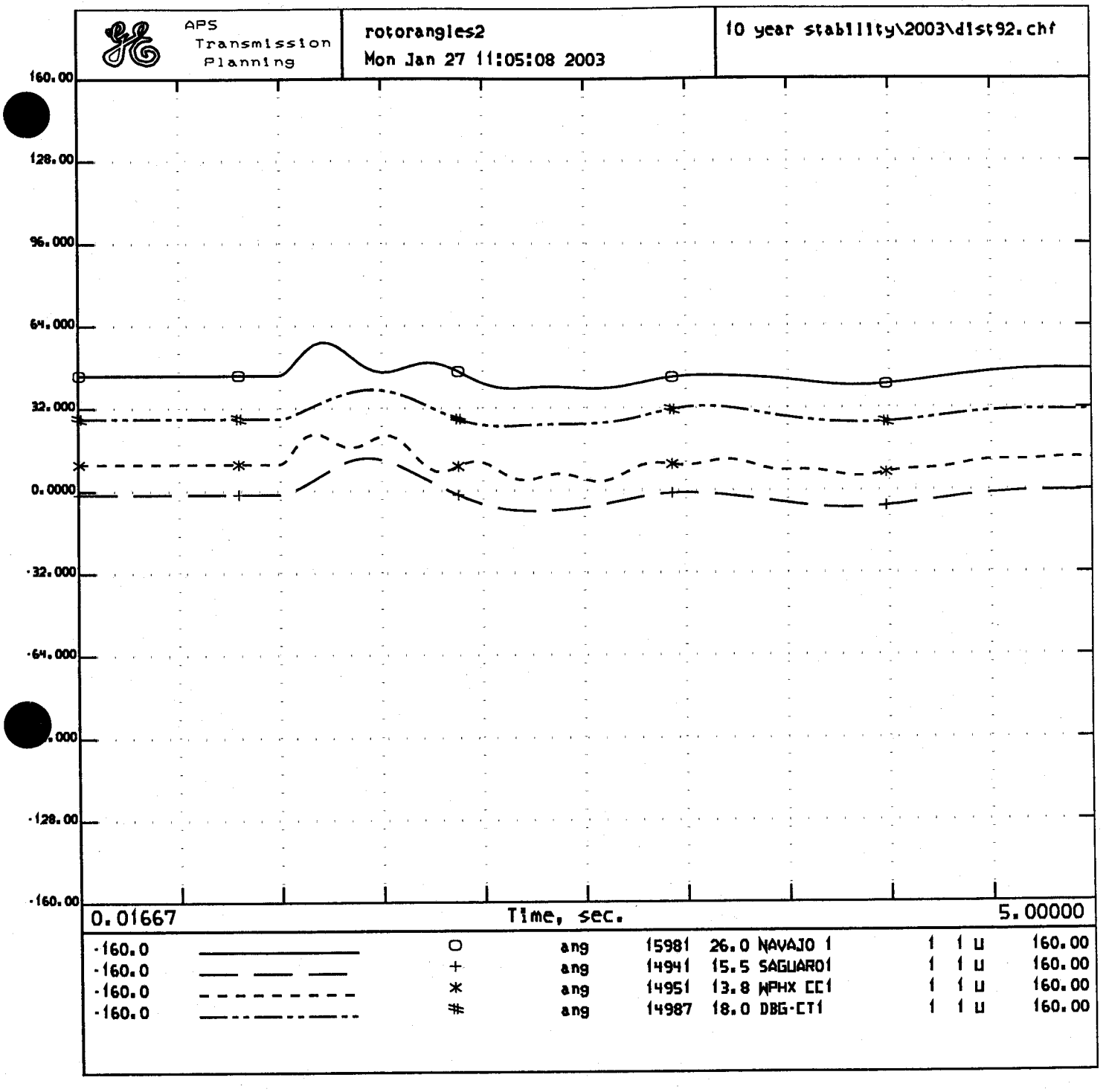

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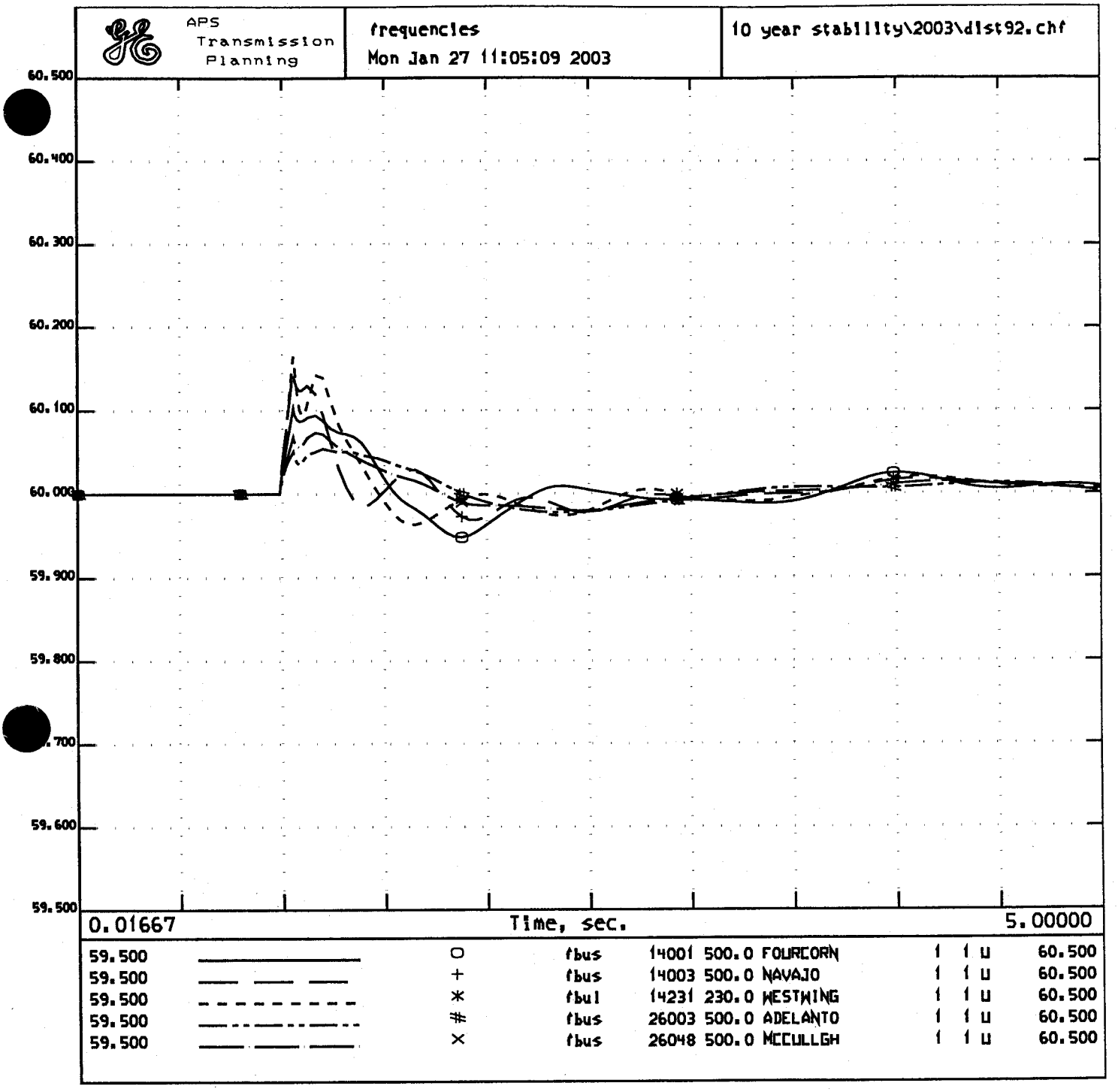

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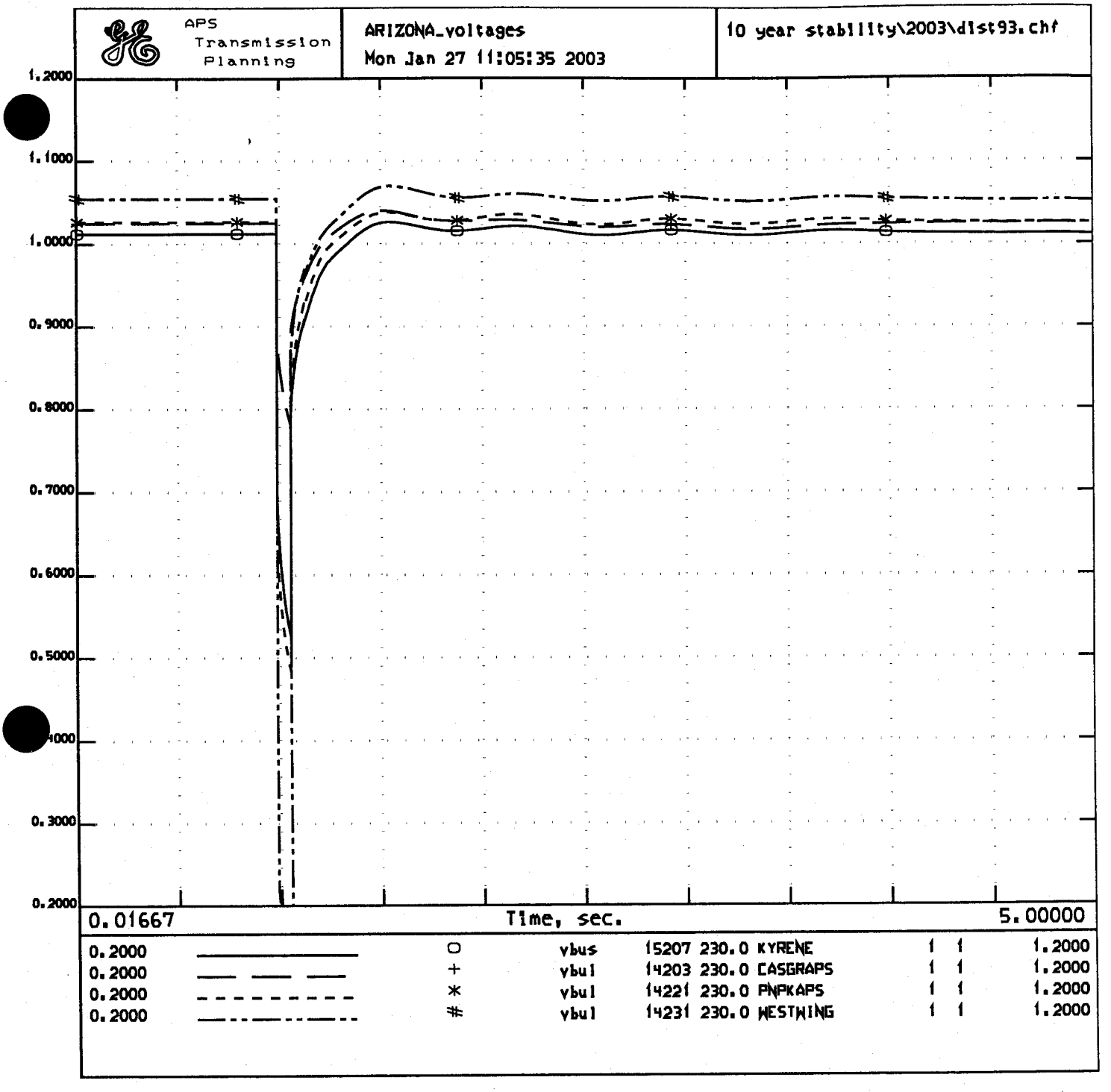
B140



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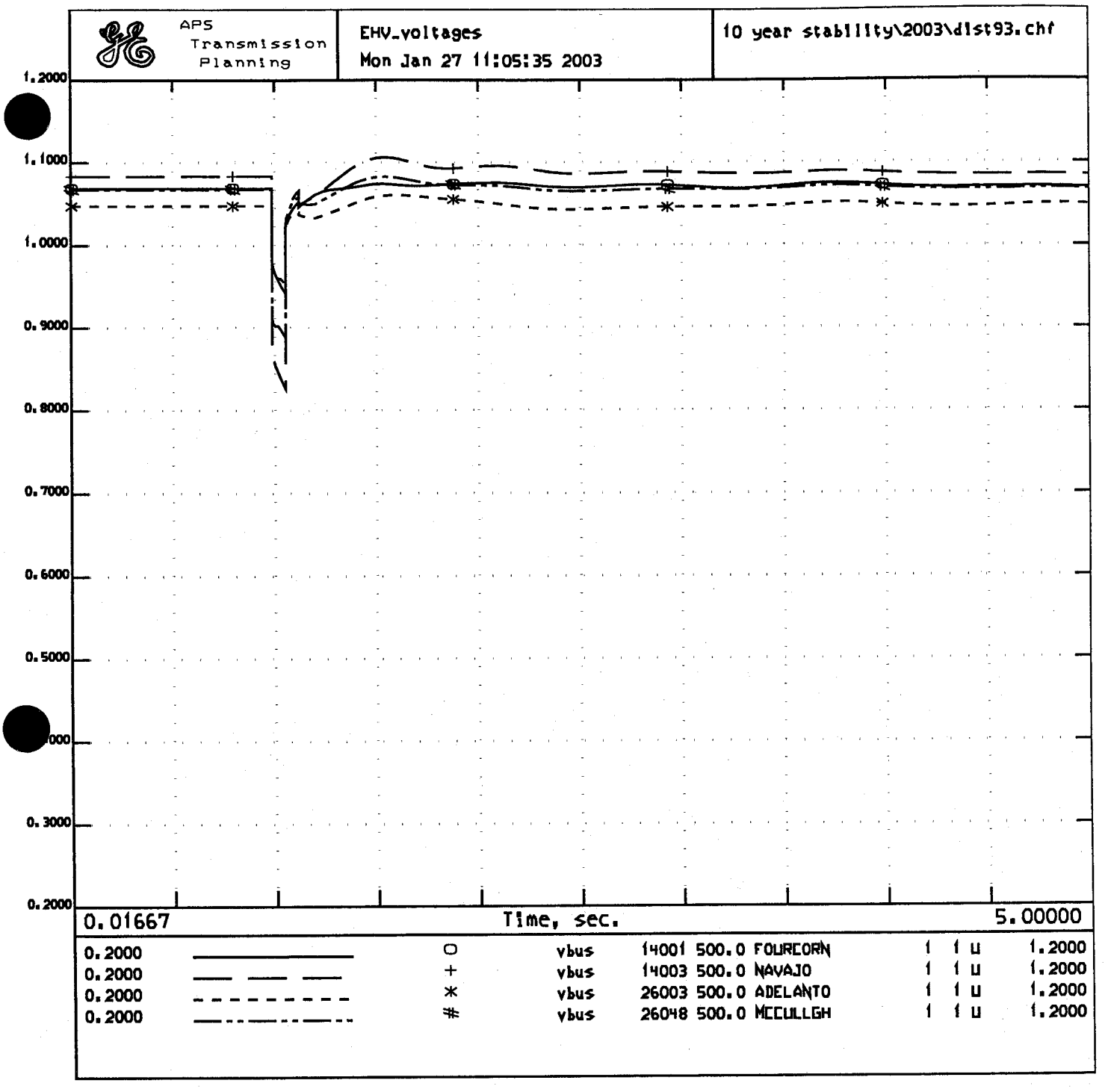

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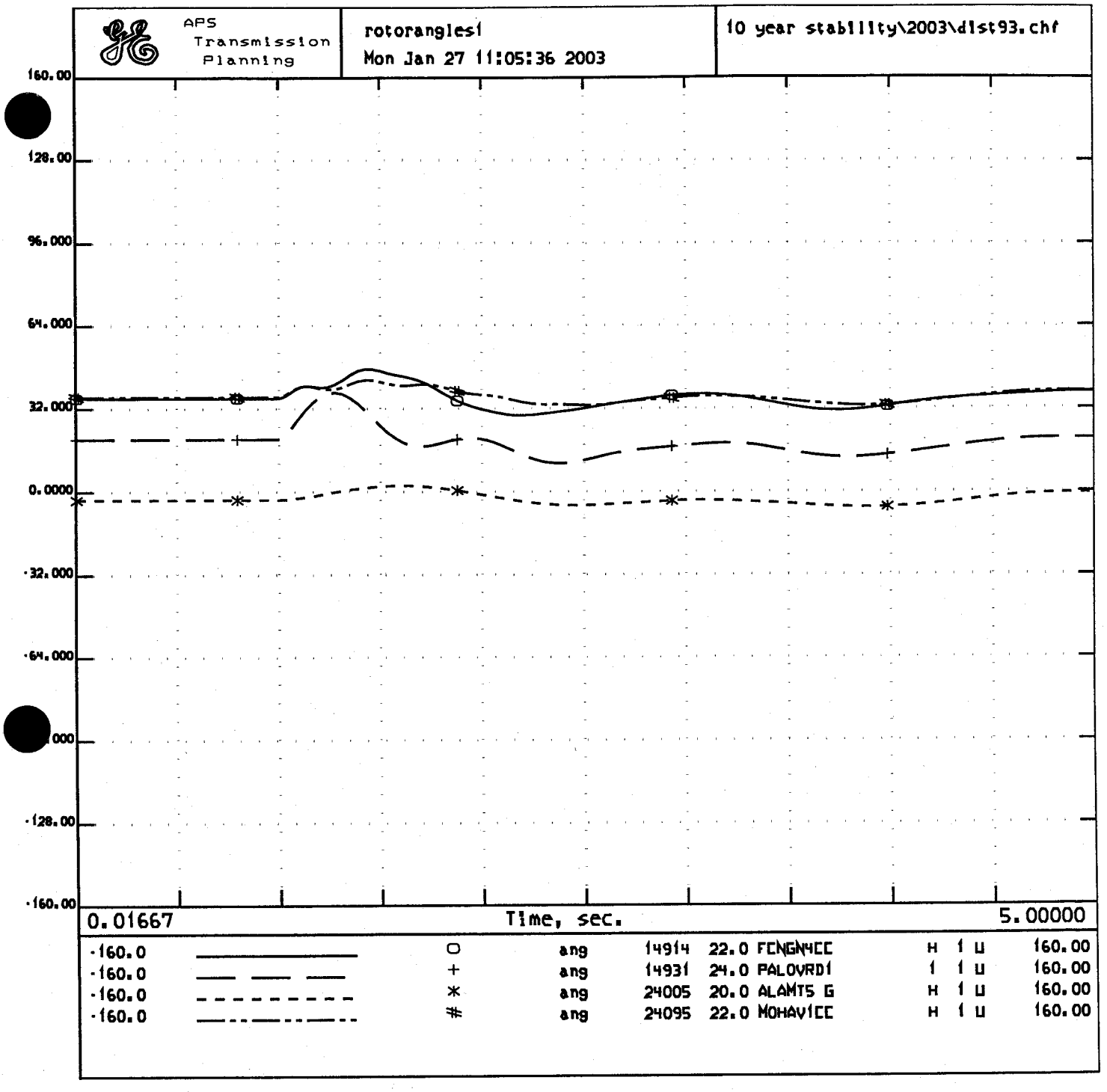

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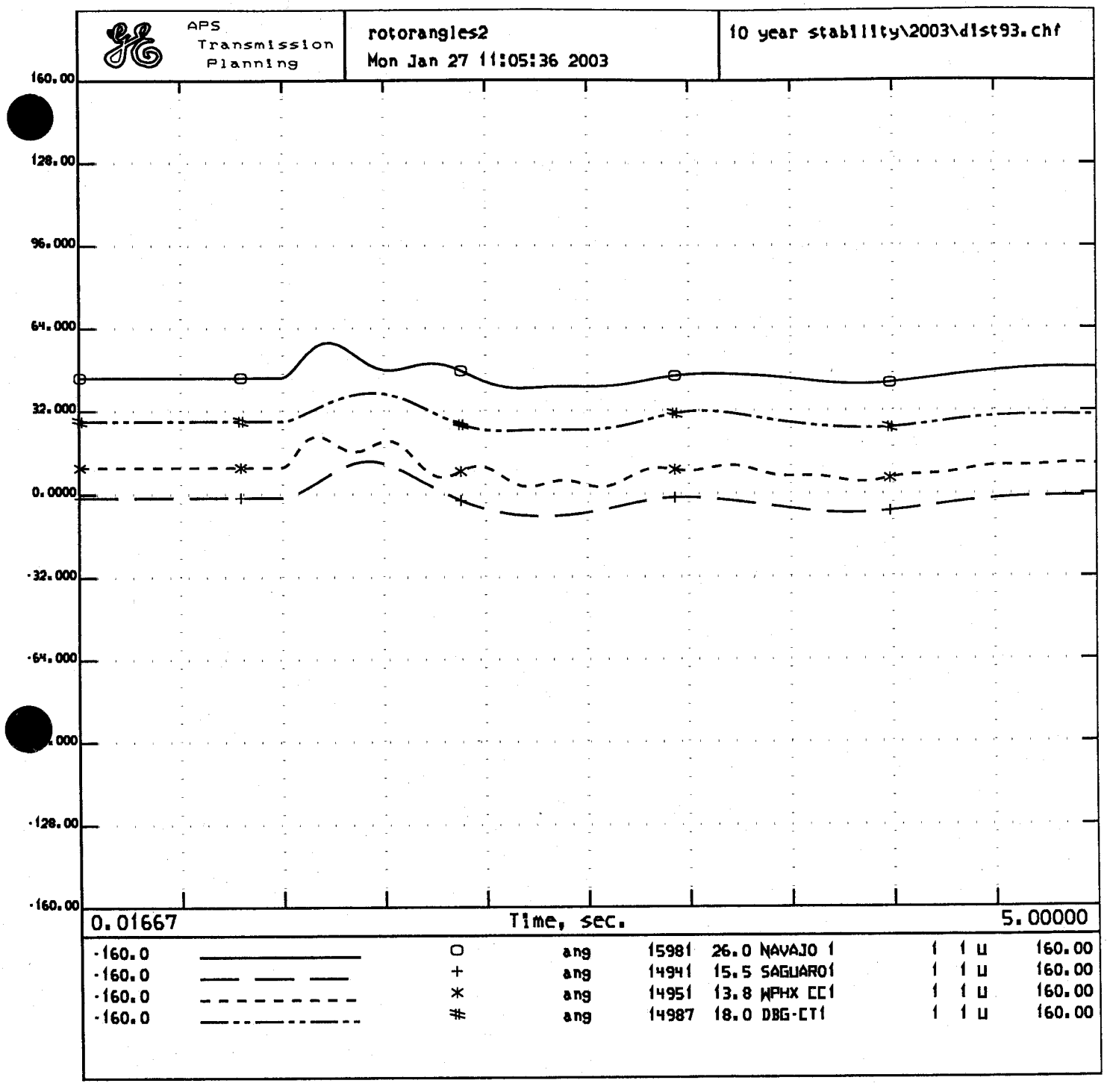

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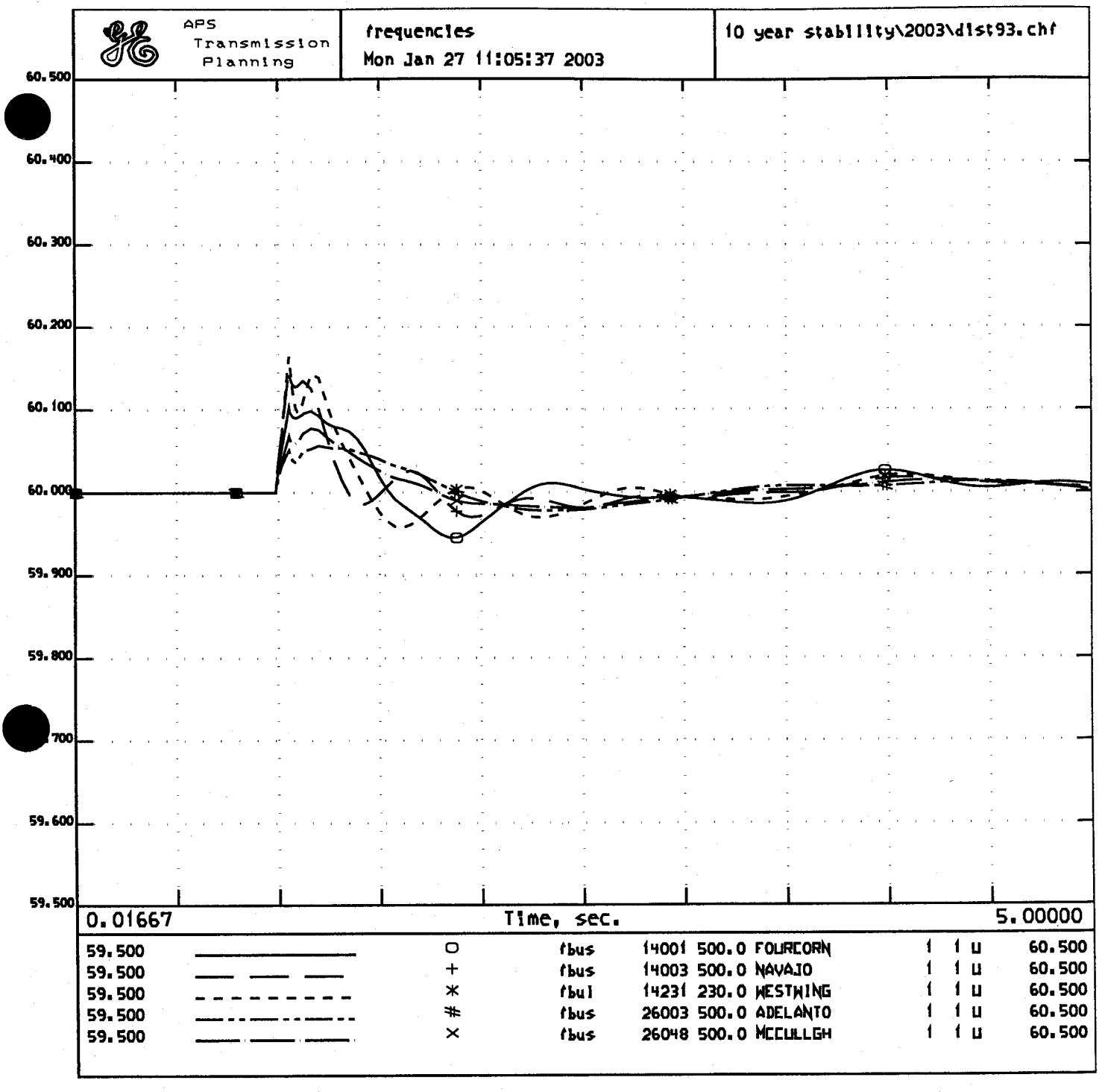

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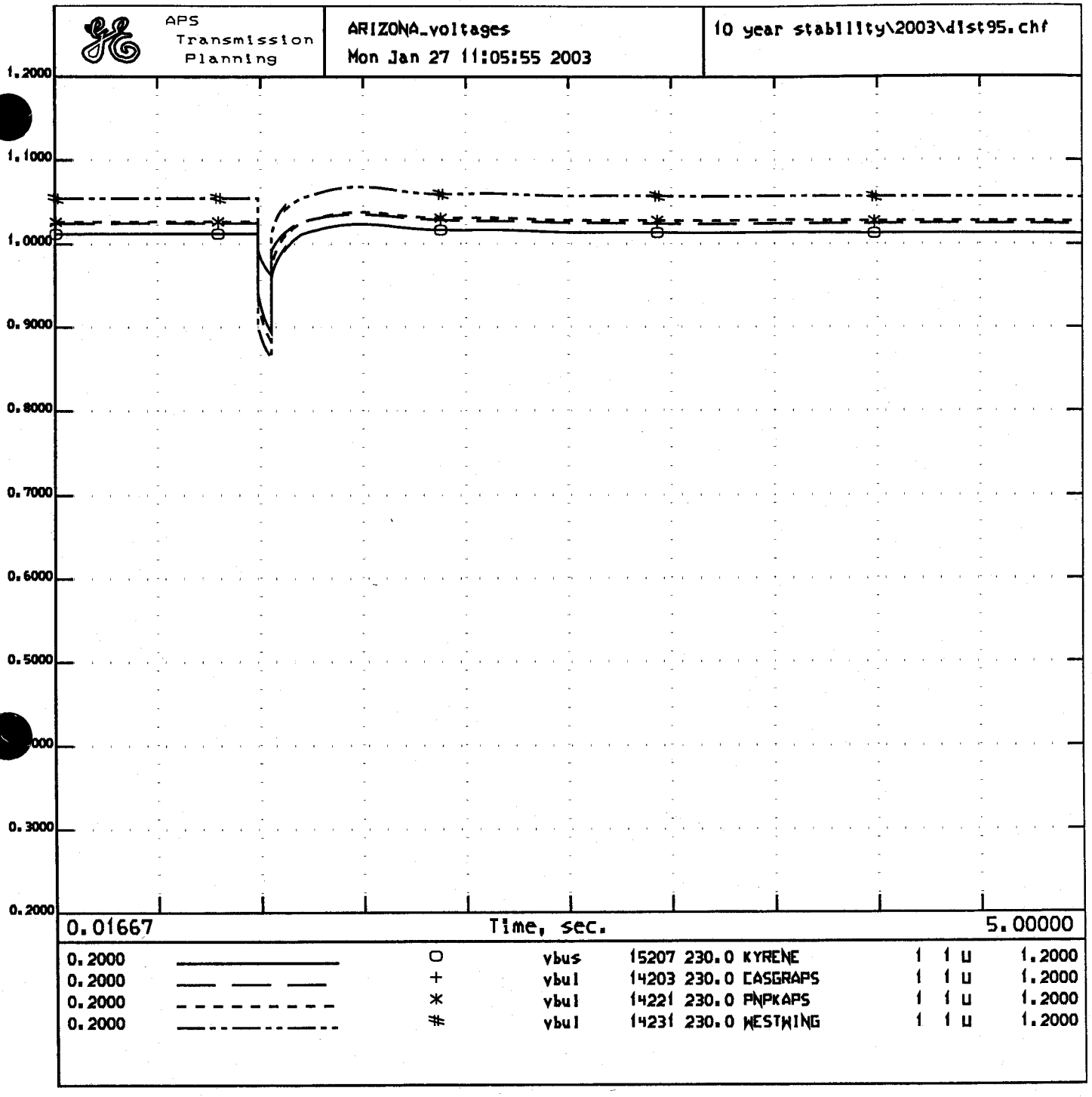

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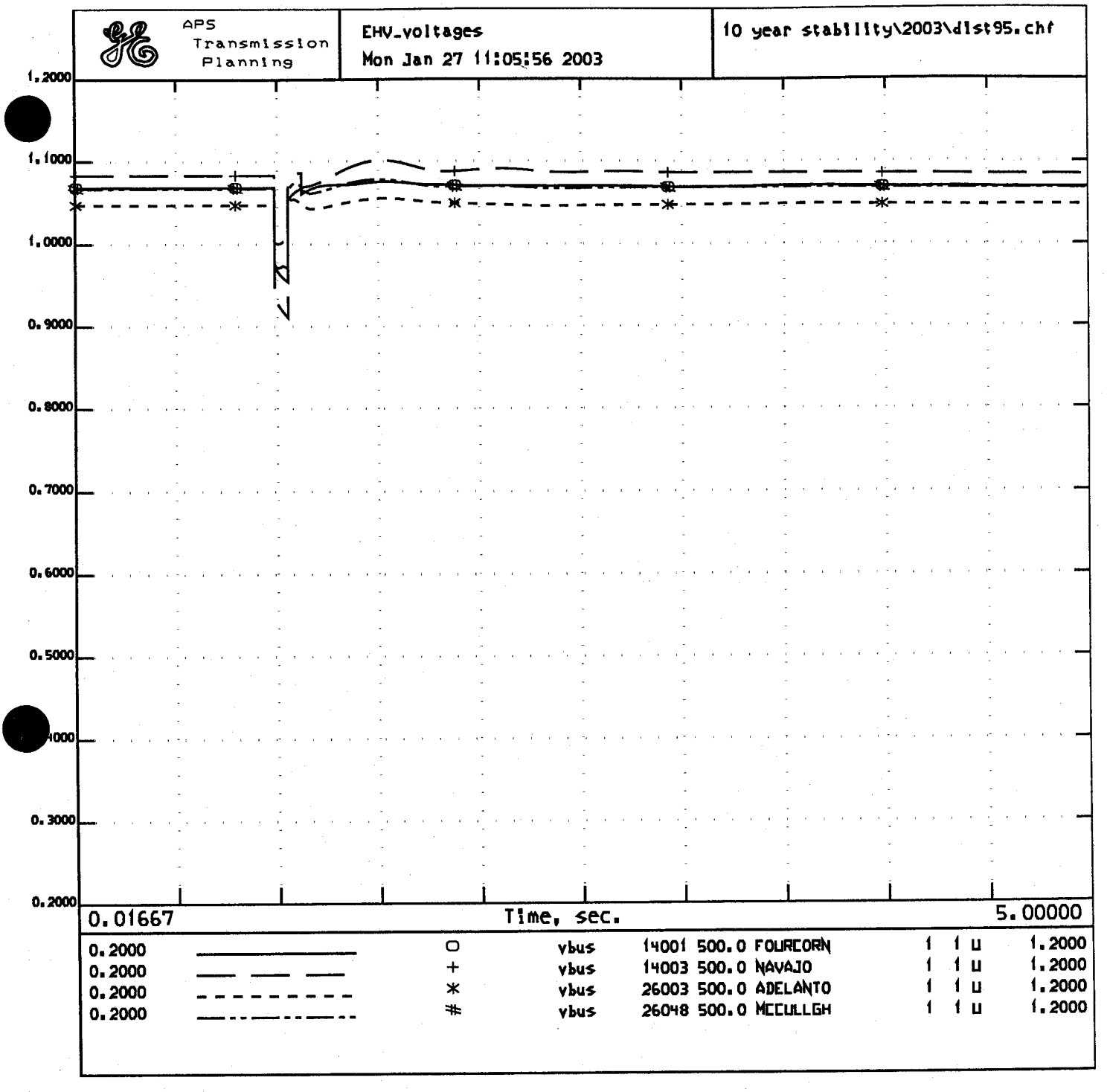

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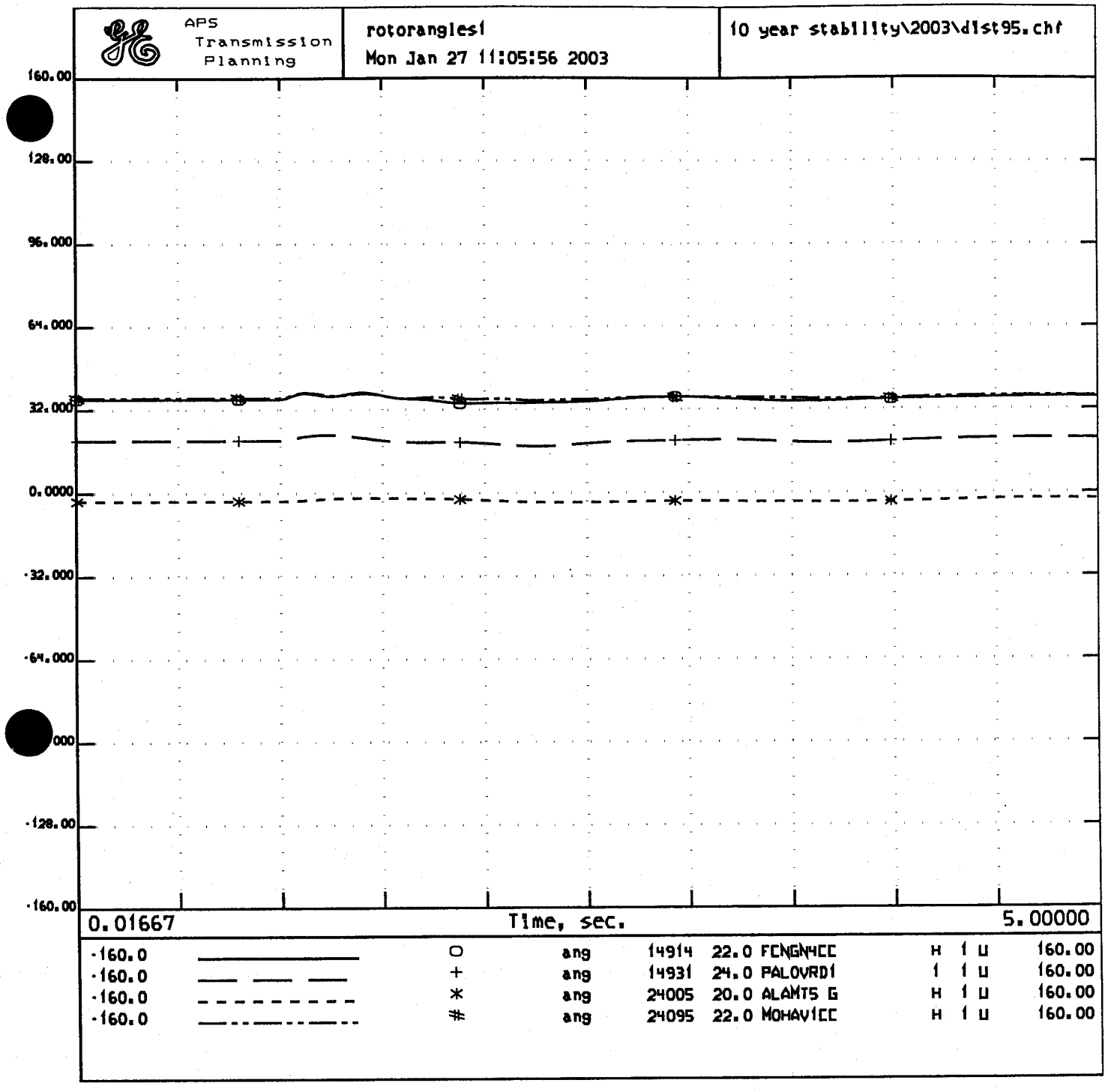

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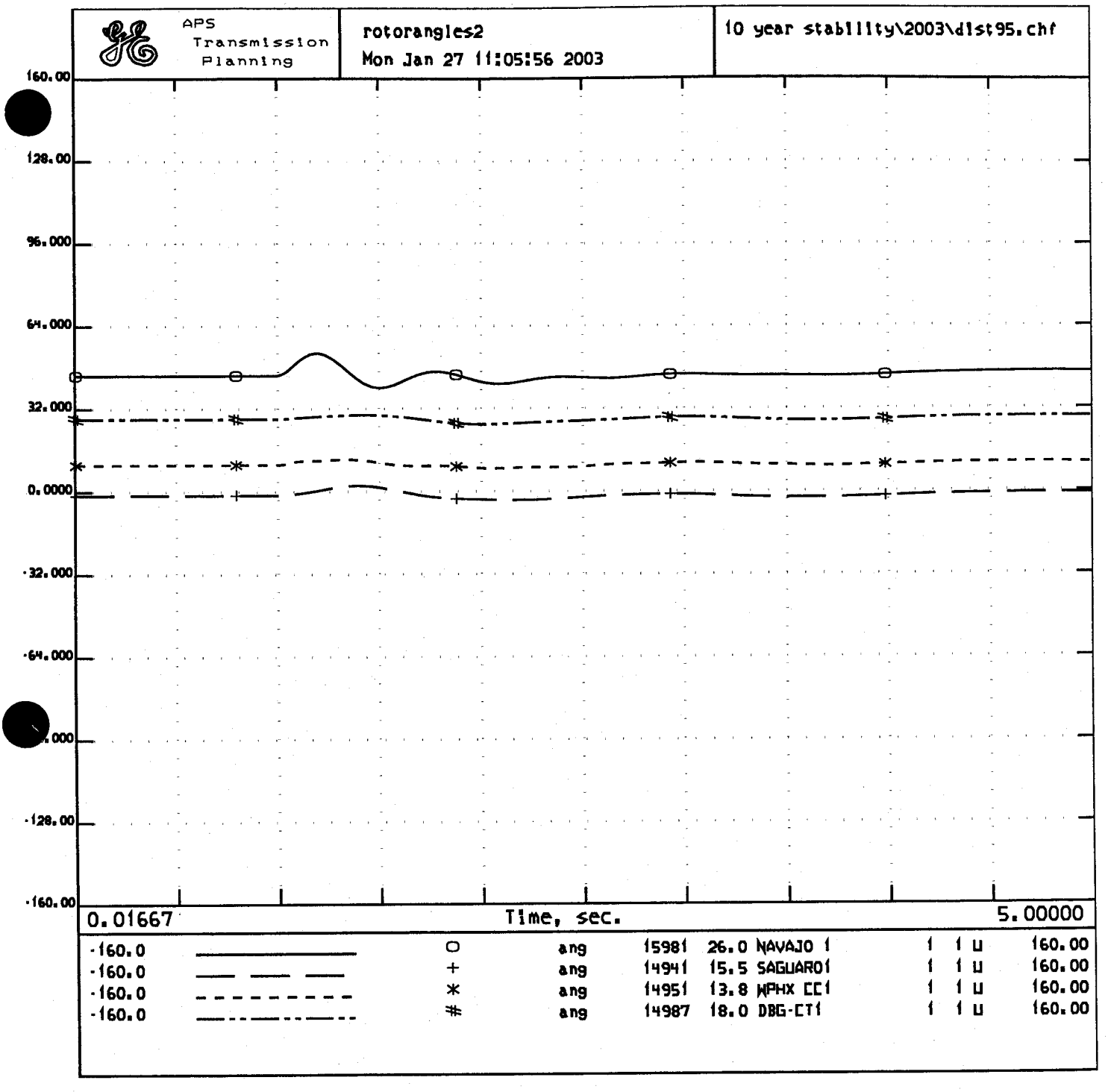

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APS Transmission Planning

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Mon Jan 27 11:05:57 2003

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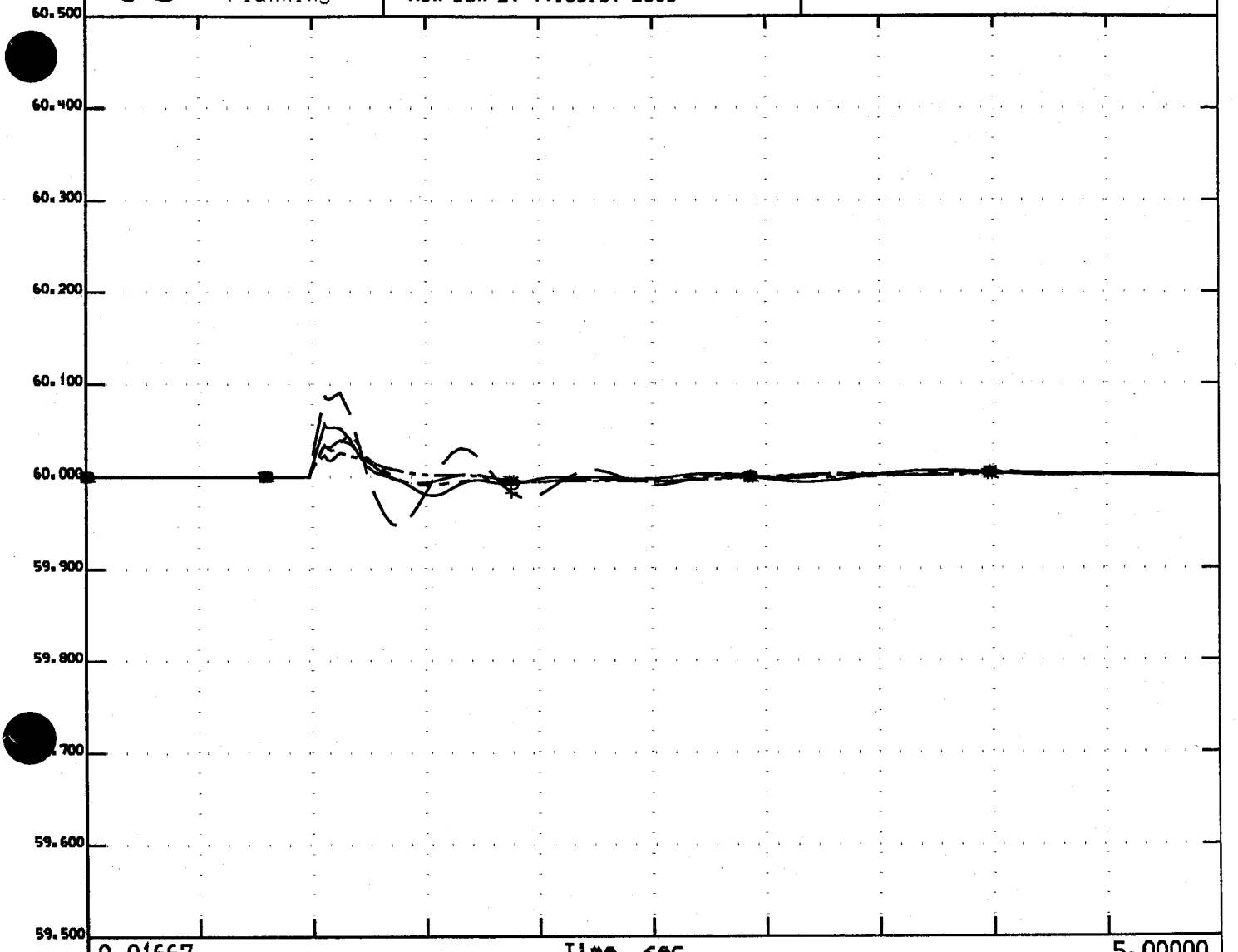

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59.500	— — —	+	fbus	14003	500.0	NAVAJO	1	1 u	60.500
59.500	- - - - -	*	fbul	14231	230.0	WESTWING	1	1 u	60.500
59.500	—-—-—	#	fbus	26003	500.0	ADELANTO	1	1 u	60.500
59.500	—.—.—	×	fbus	26048	500.0	MCCULLGH	1	1 u	60.500

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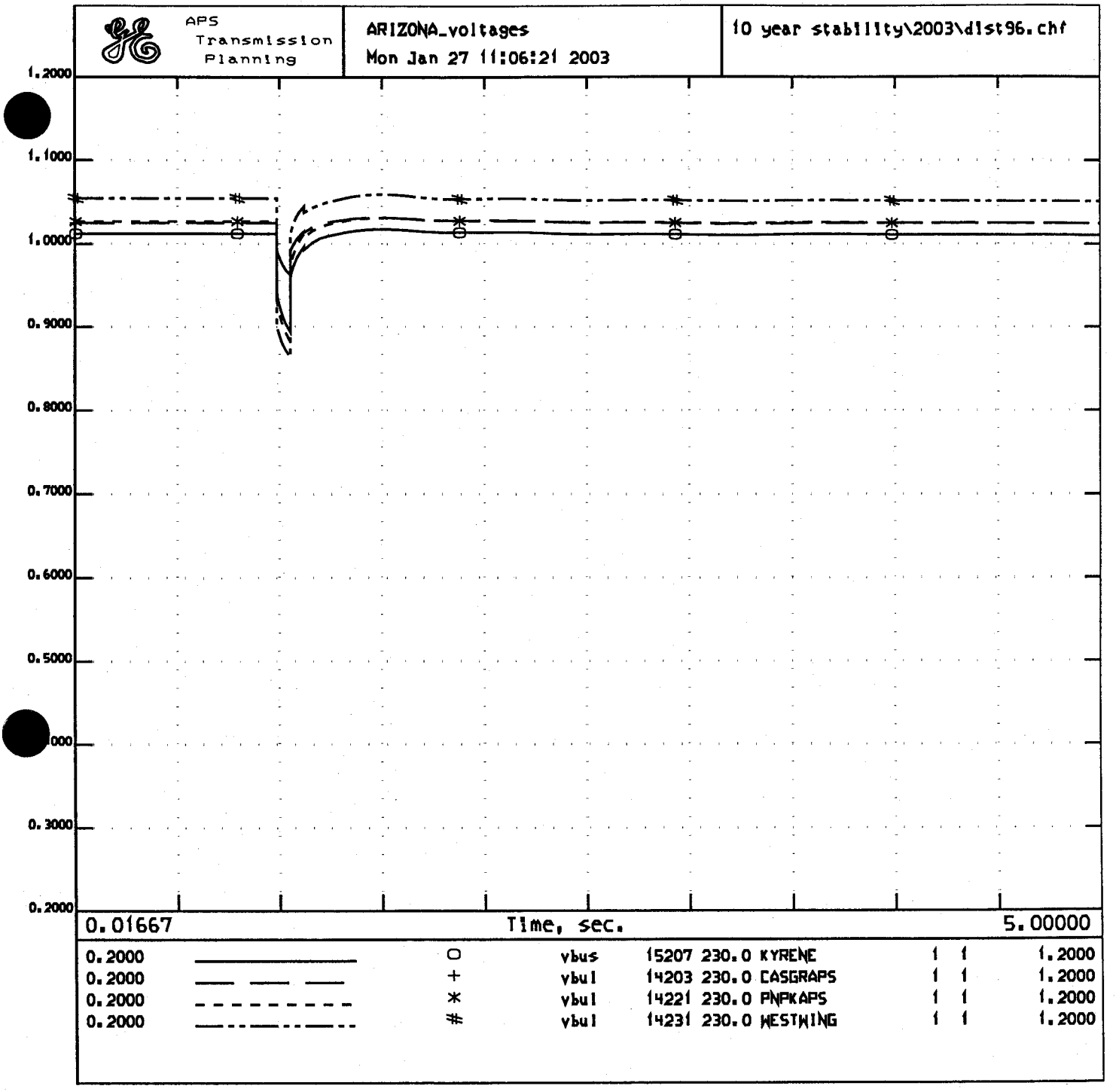

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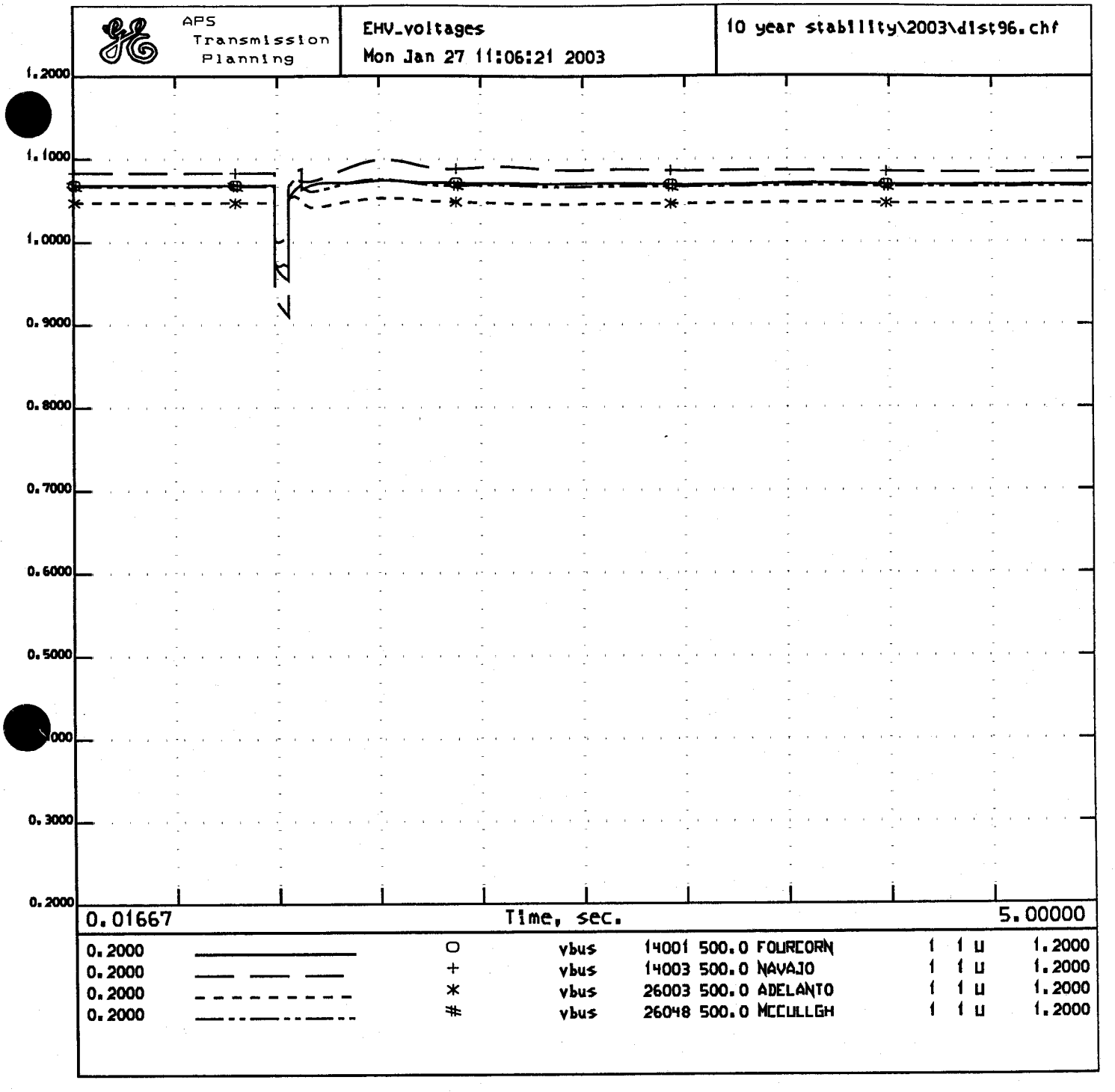

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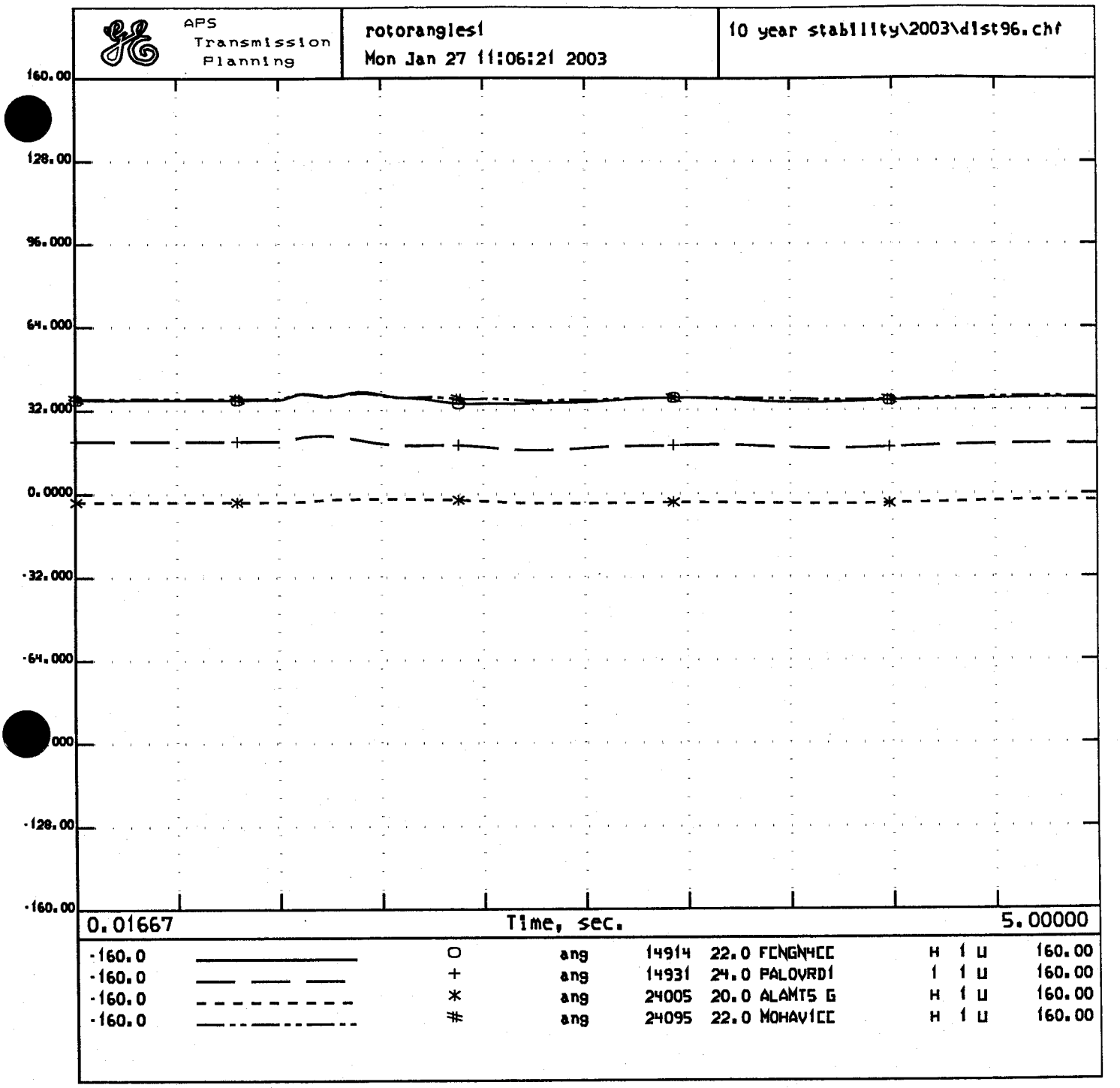

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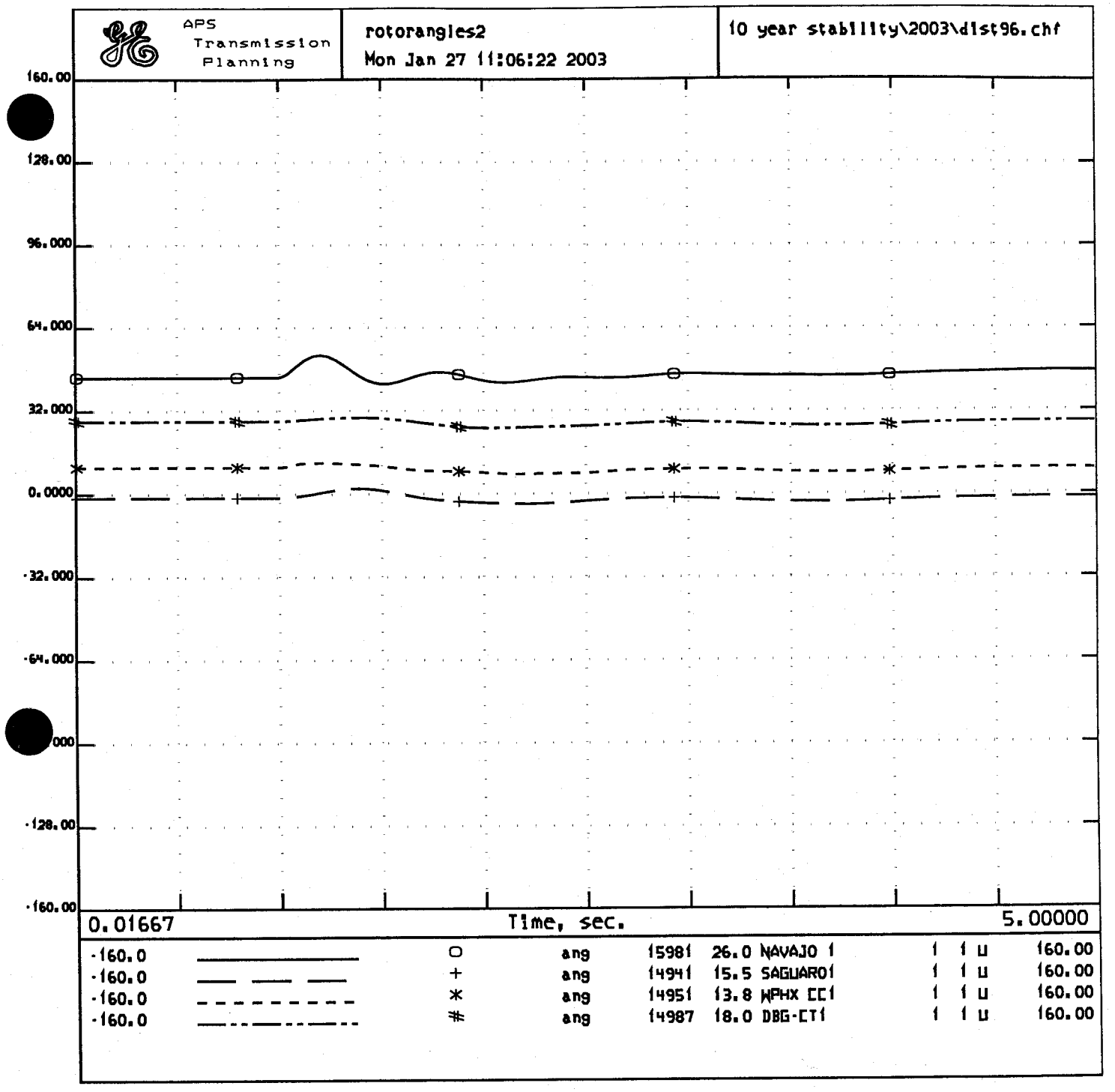

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ALL TSS COMMENTS INCLUDED.
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B154

APS Transmission Planning

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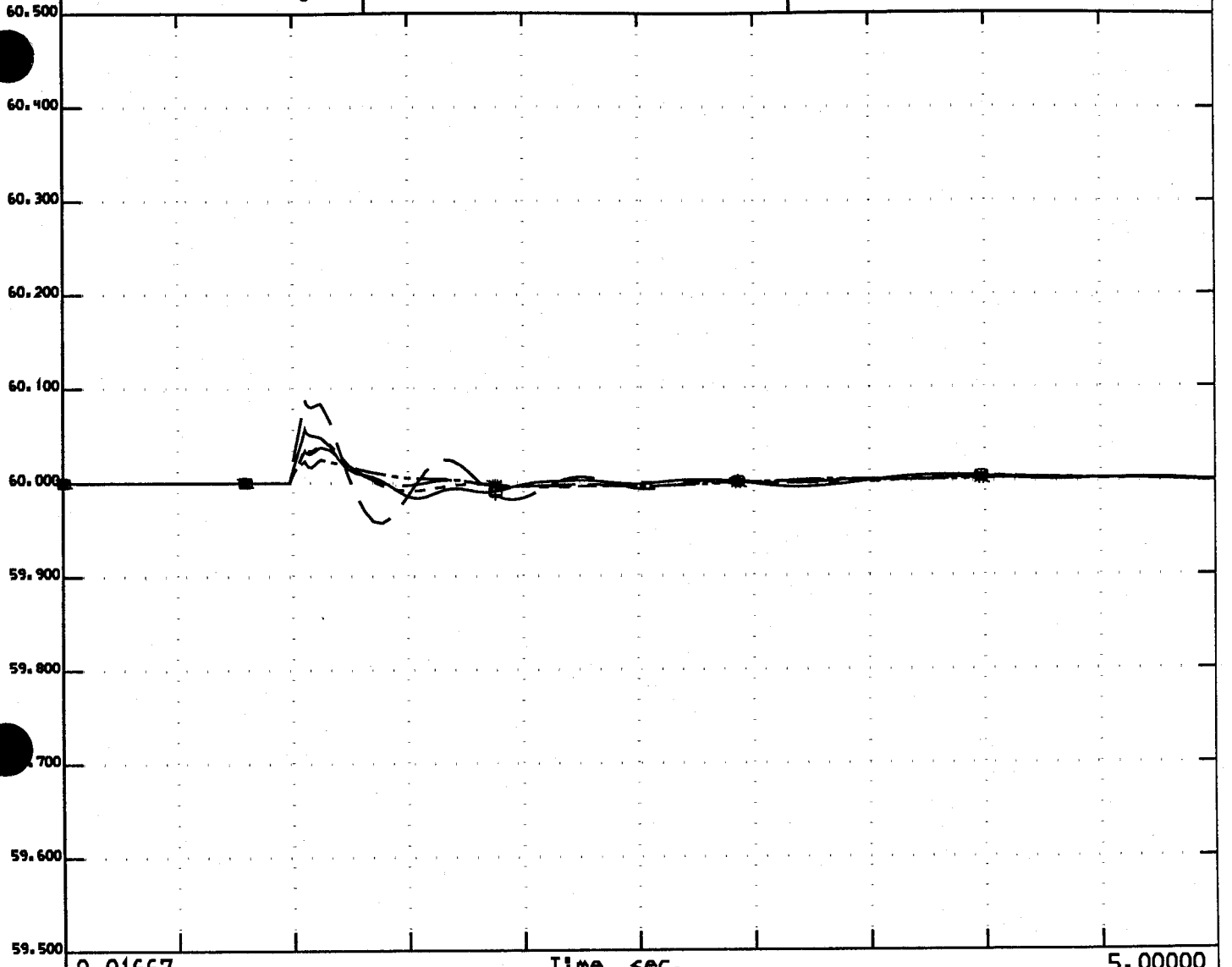

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APPENDIX C

2010
Stability Plots

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Yavapai 500kv
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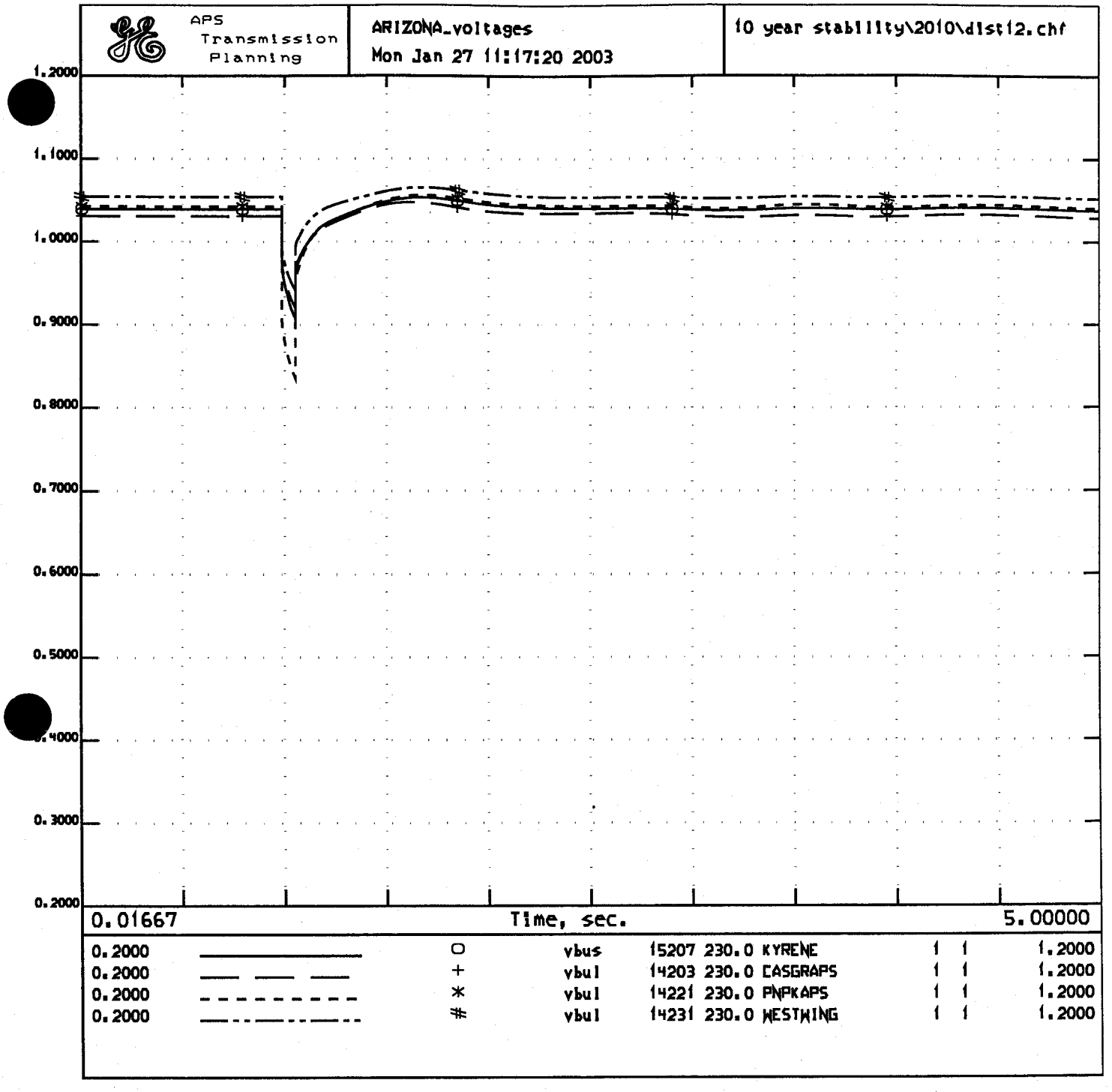
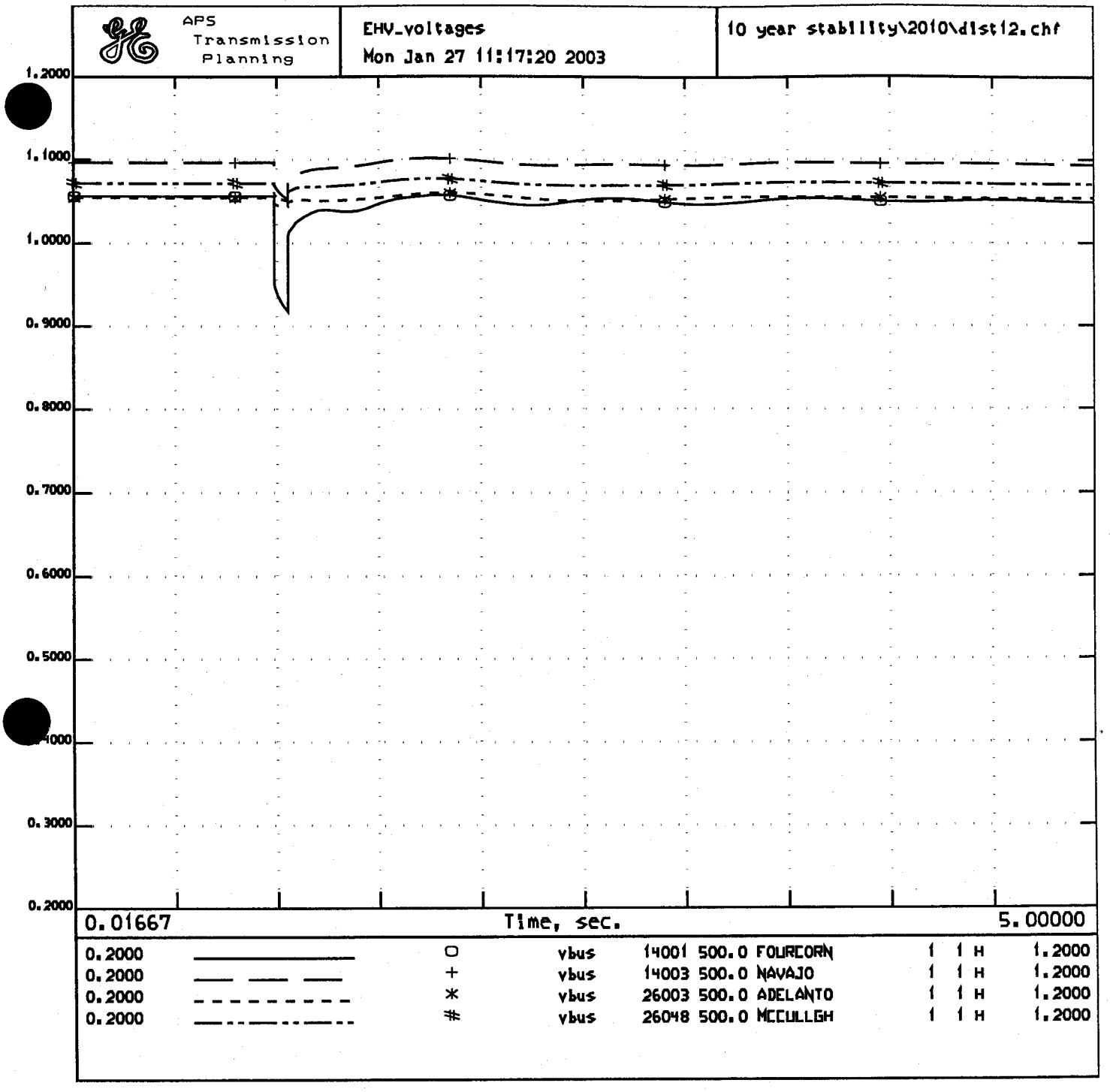


CHOLLA FLT CH-FC LINE OUT!
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
CHO-FC #1 STAB; 01/03; T=0 3P FLT CHO345;FLSH FCN-CHO CAPS;
4C CLR FLT W/CHO-FC #1;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



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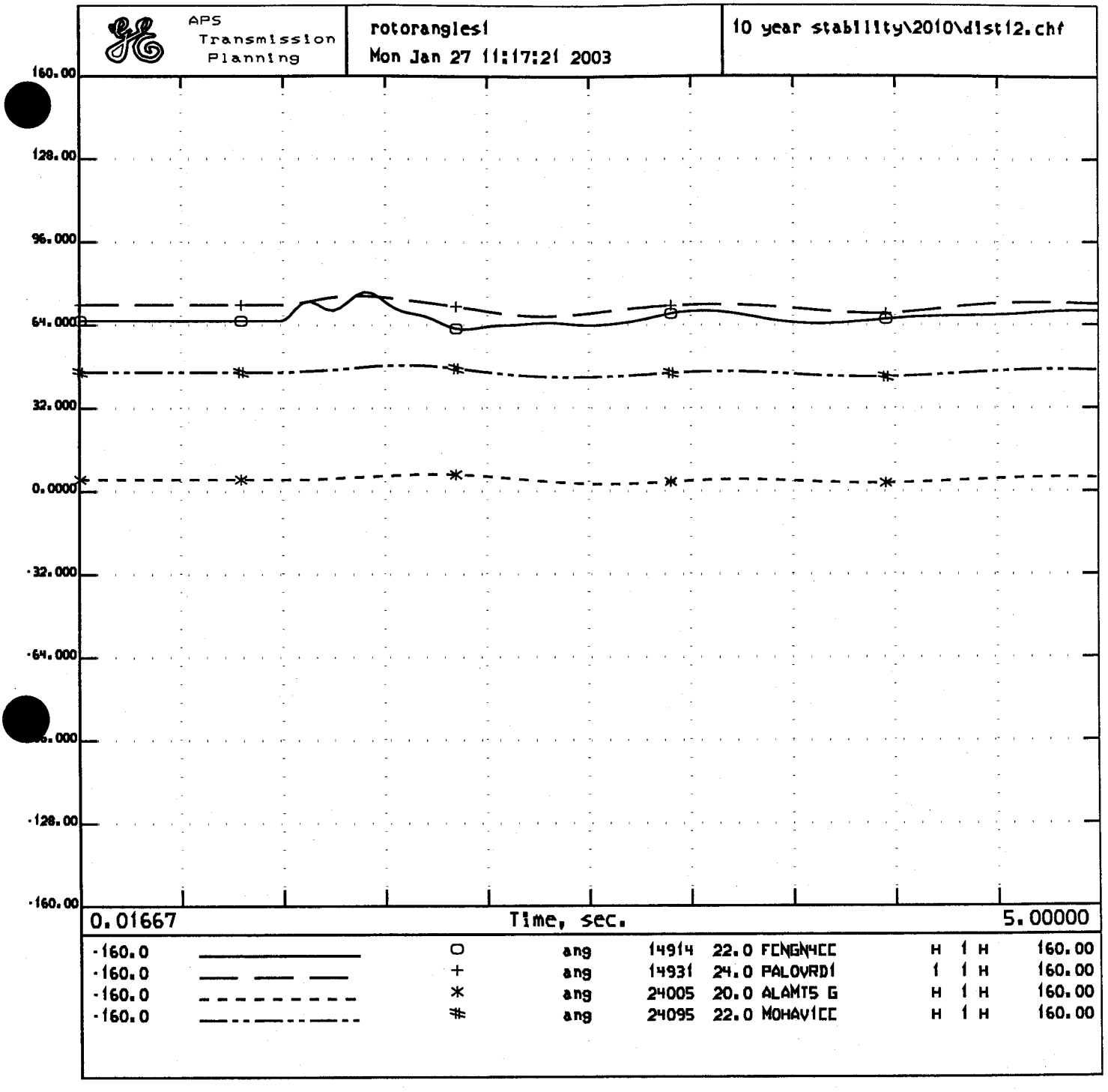

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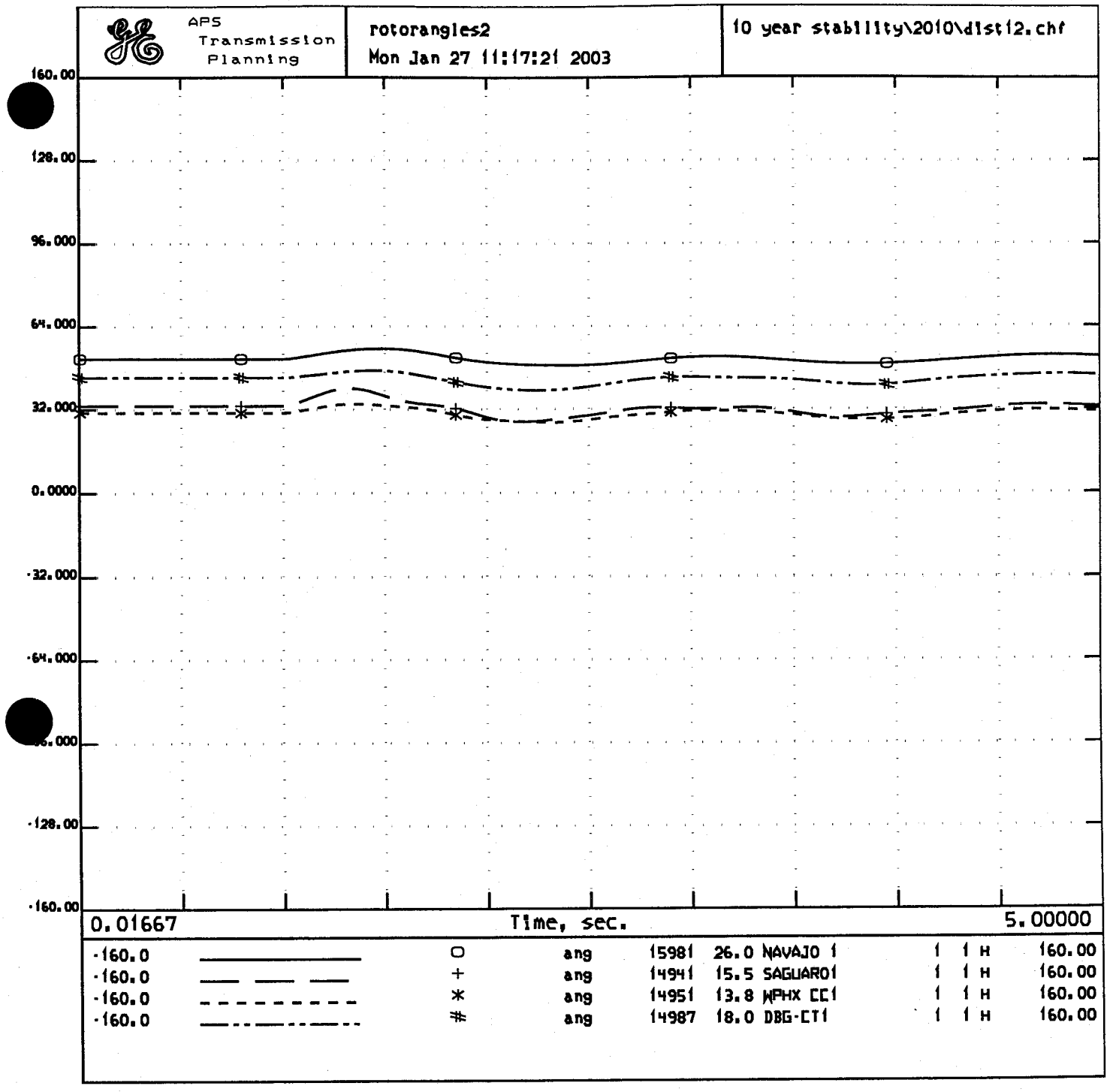

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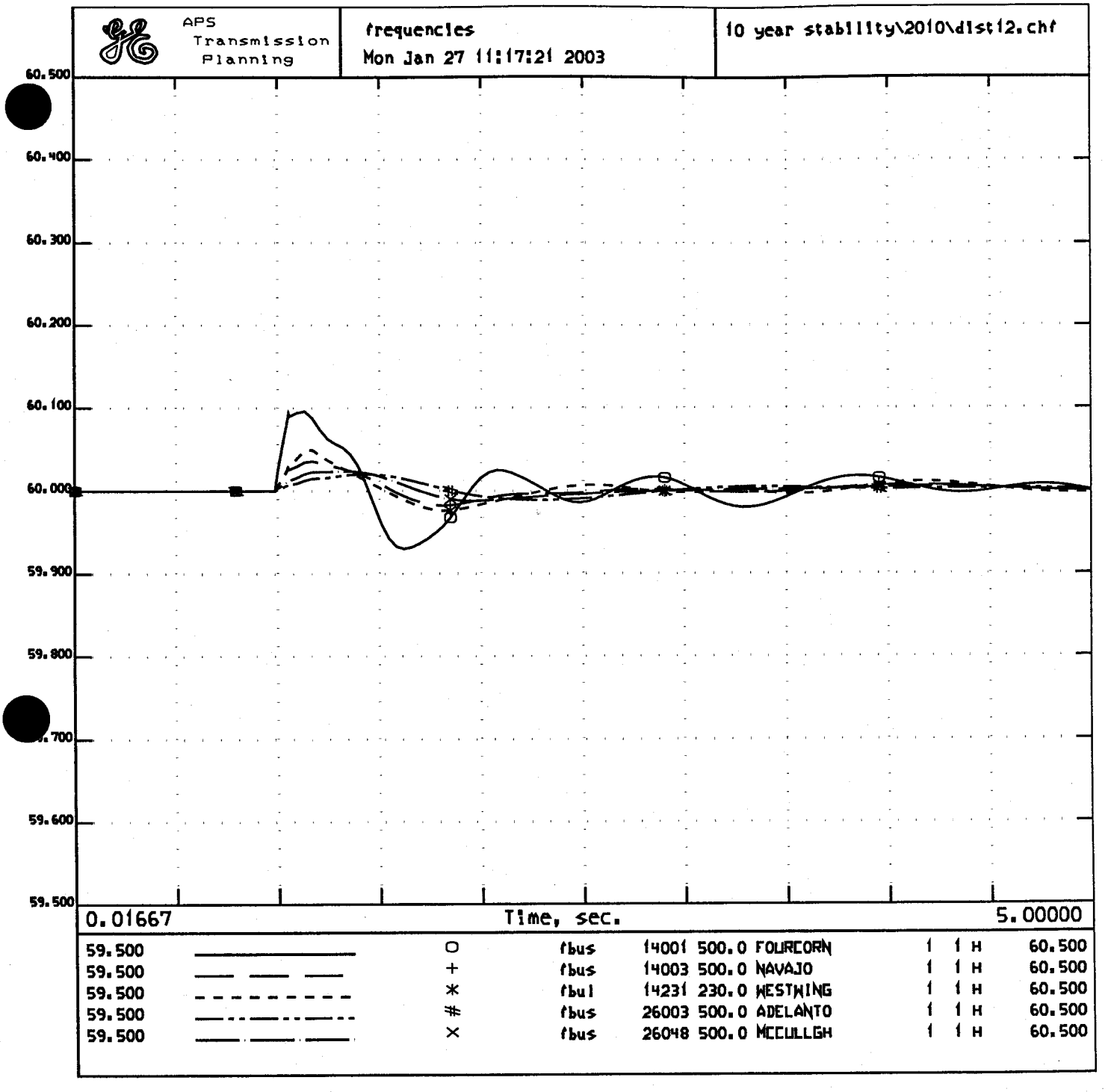

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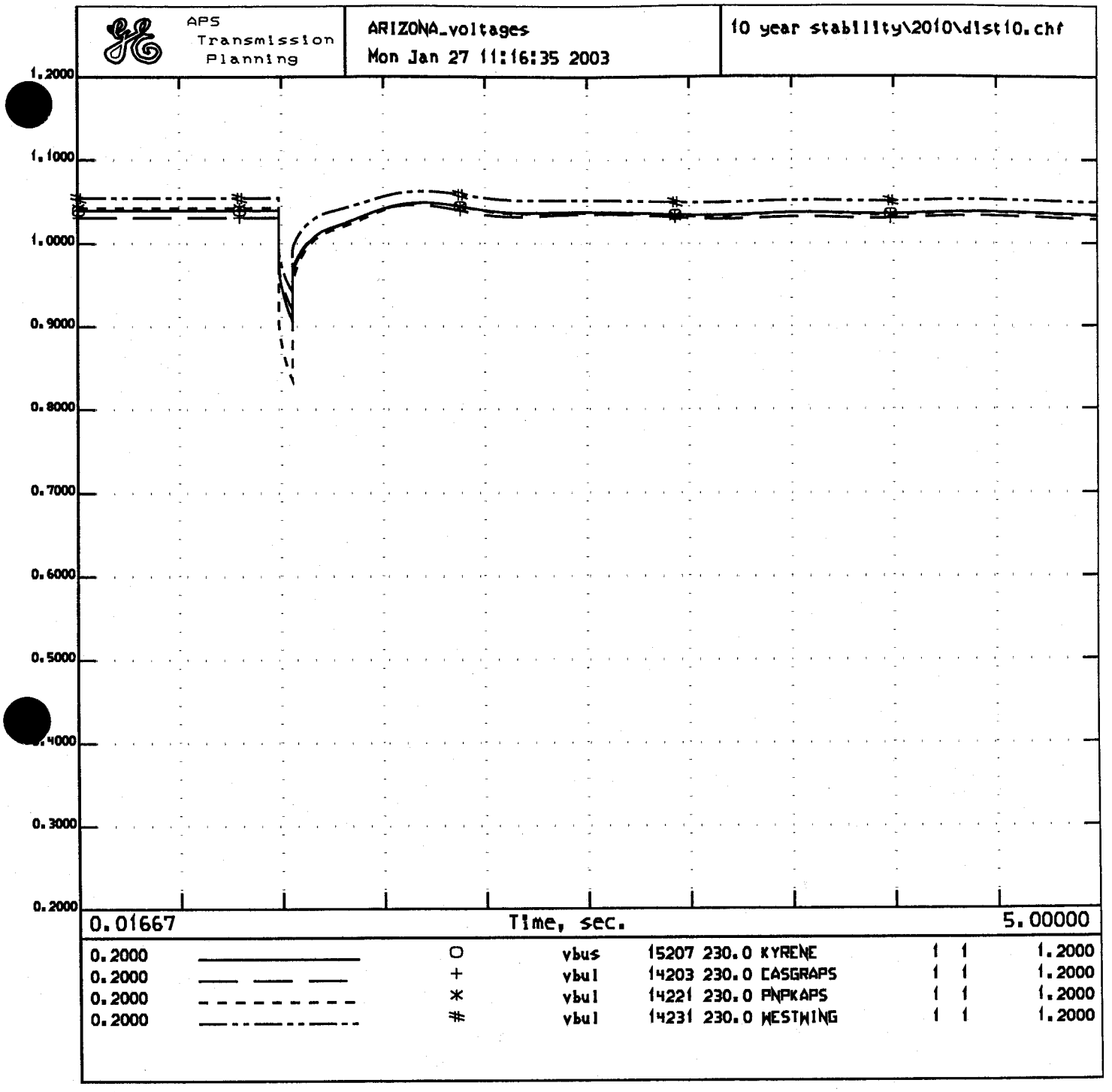

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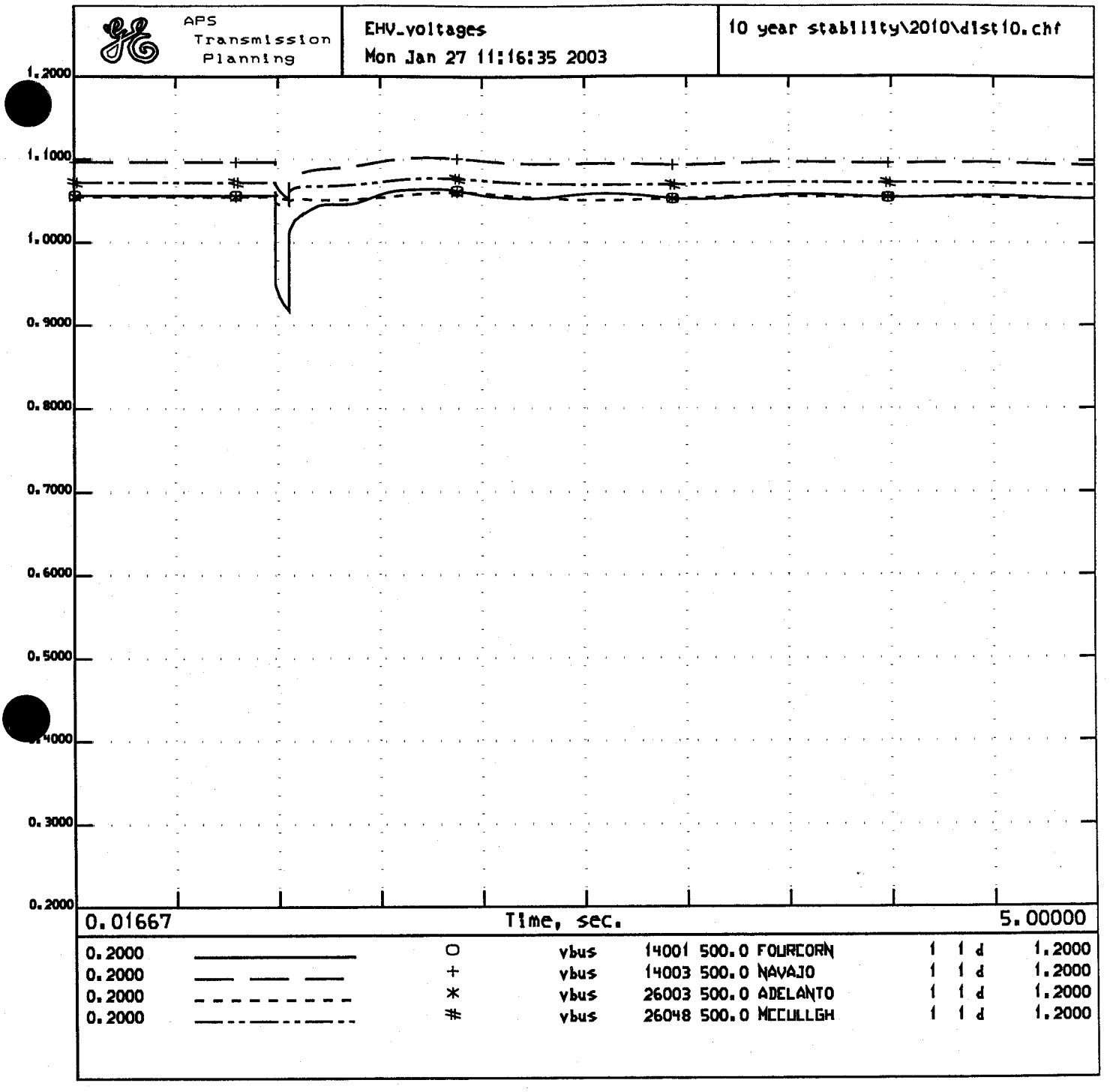

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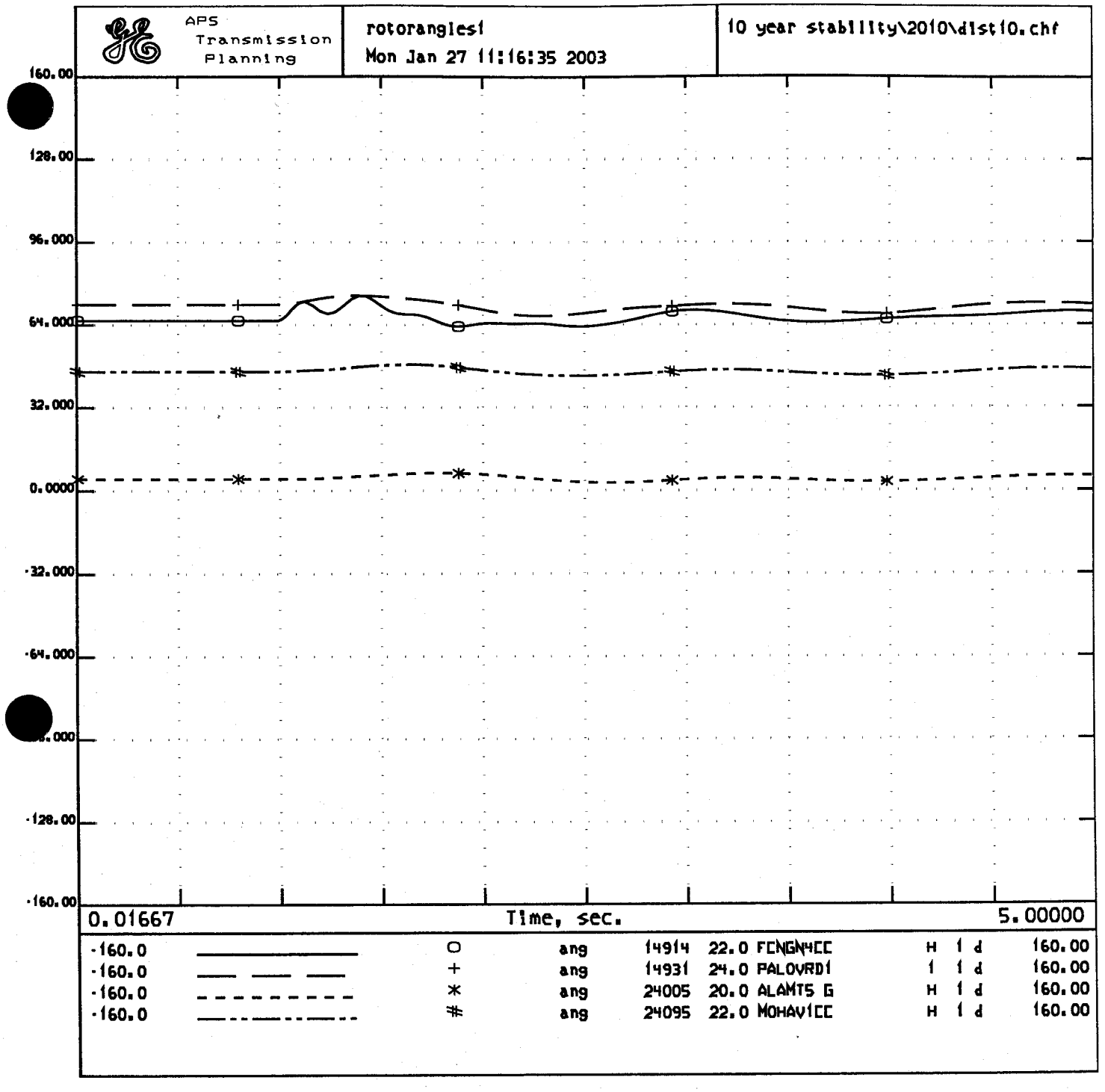

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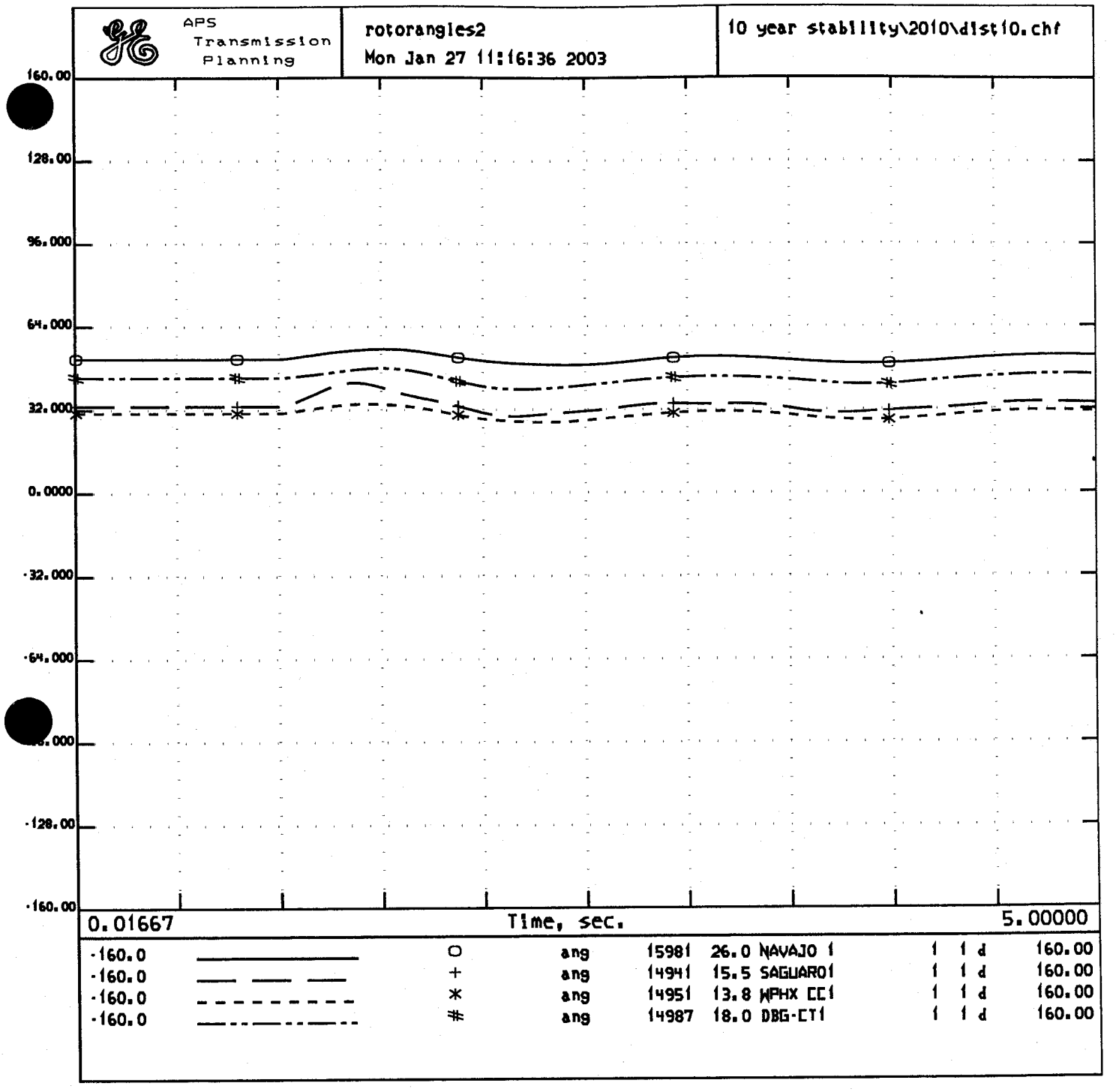
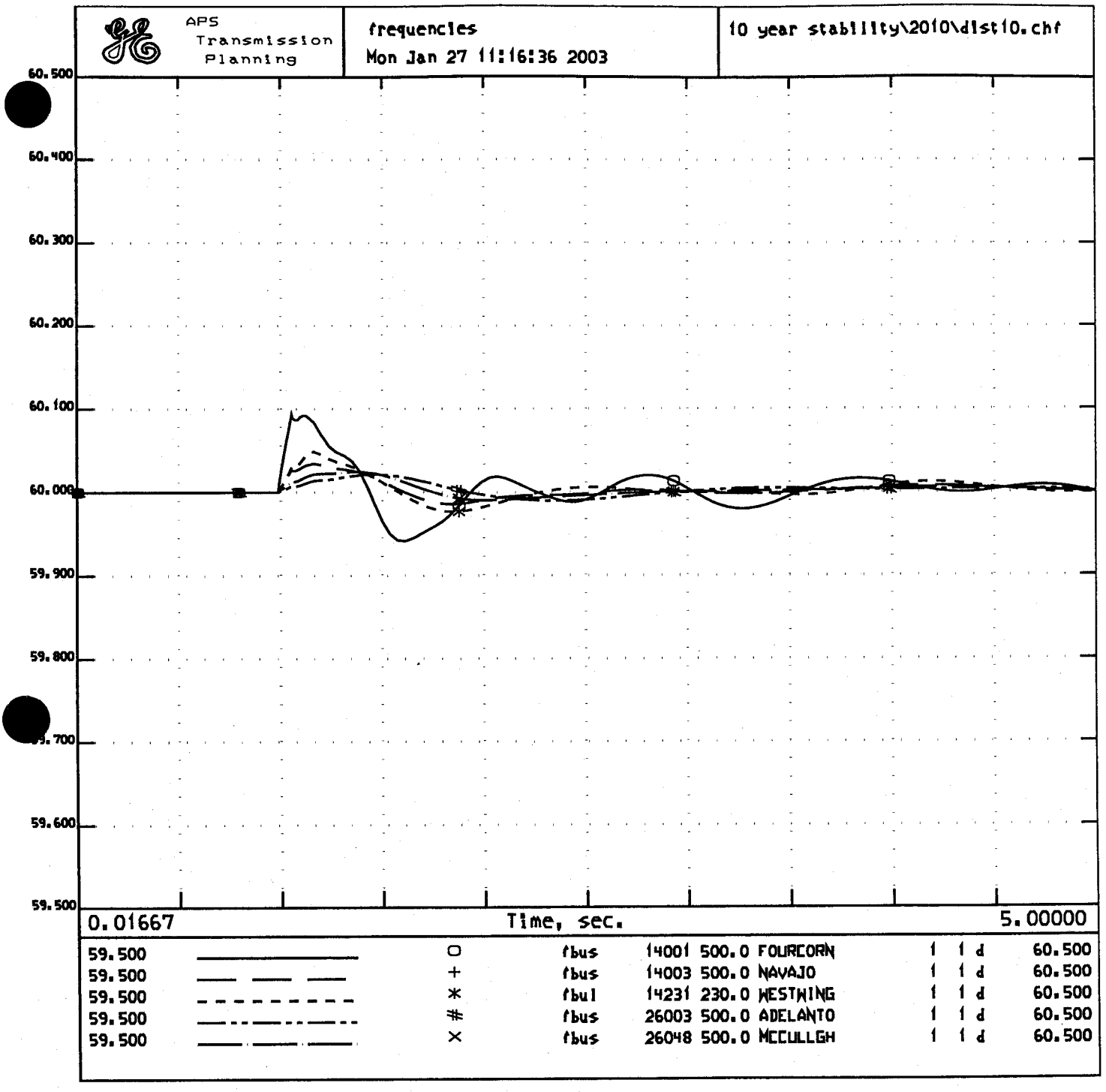


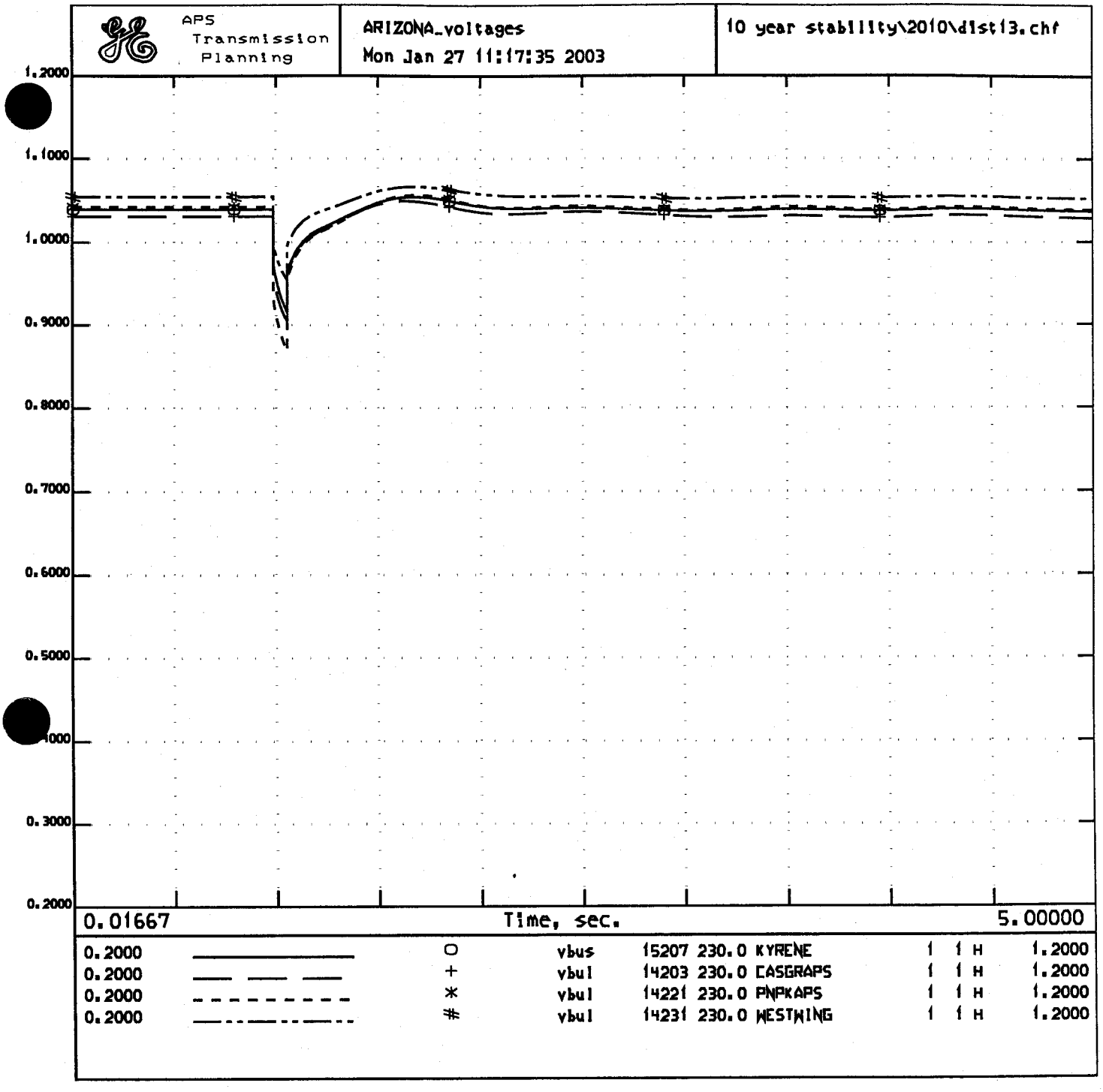
CHOLLA FLT CH-PPK LINE OUT!
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
CHO-PPK #1 STAB; 01/03; T=0 3P FLT CHO345;FLSH FCN-CHO CAPS;
4C CLR FLT W/CHO-PPK #1;8C REIN CAPS;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



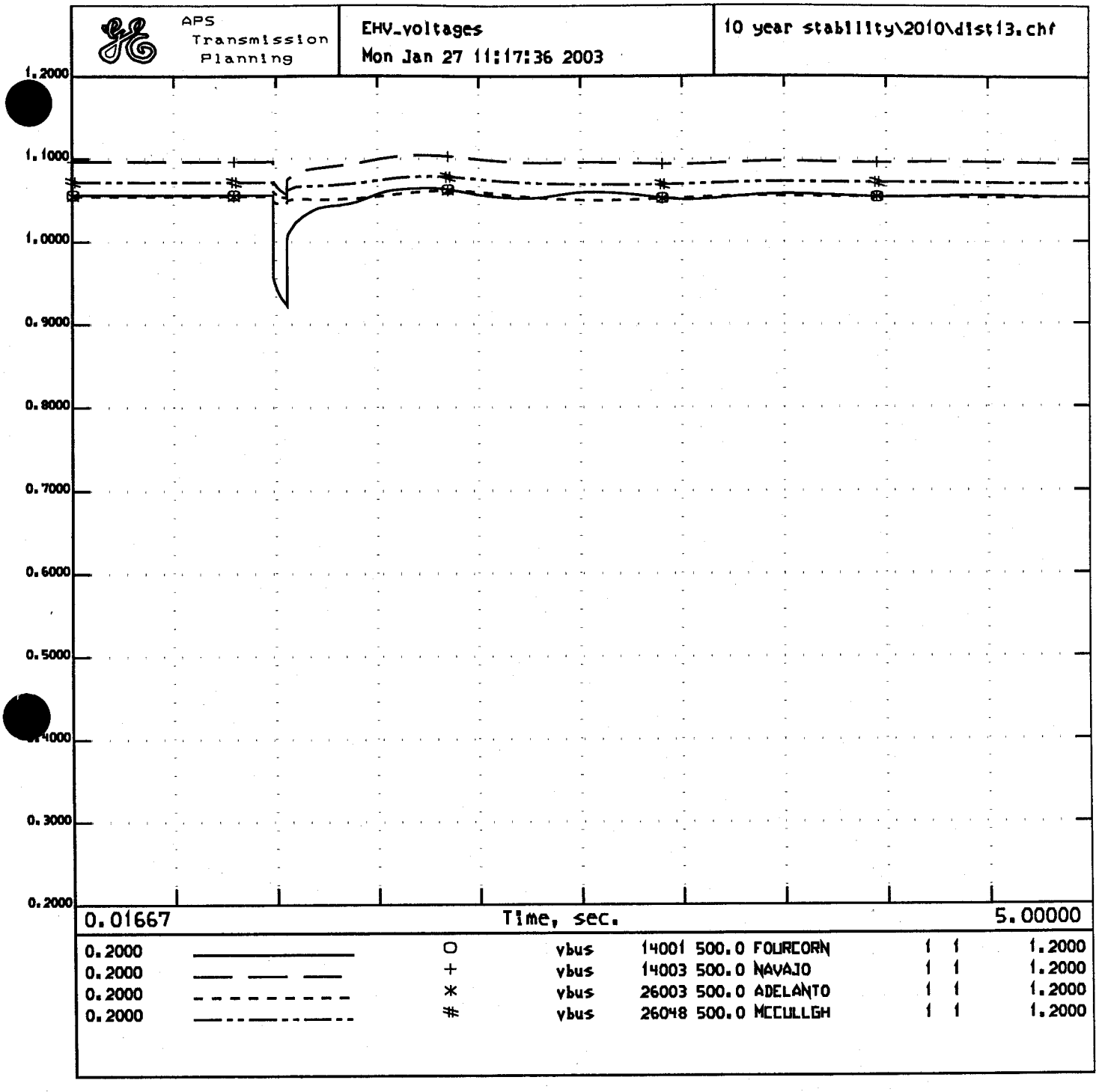
CHOLLA FLT CH-PPK LINE OUT!
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
CHO-PPK #1 STAB; 01/03; T=0 3P FLT CHO345;FLSH FCN-CHO CAPS;
4C CLR FLT W/CHO-PPK #1;8C REIN CAPS;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



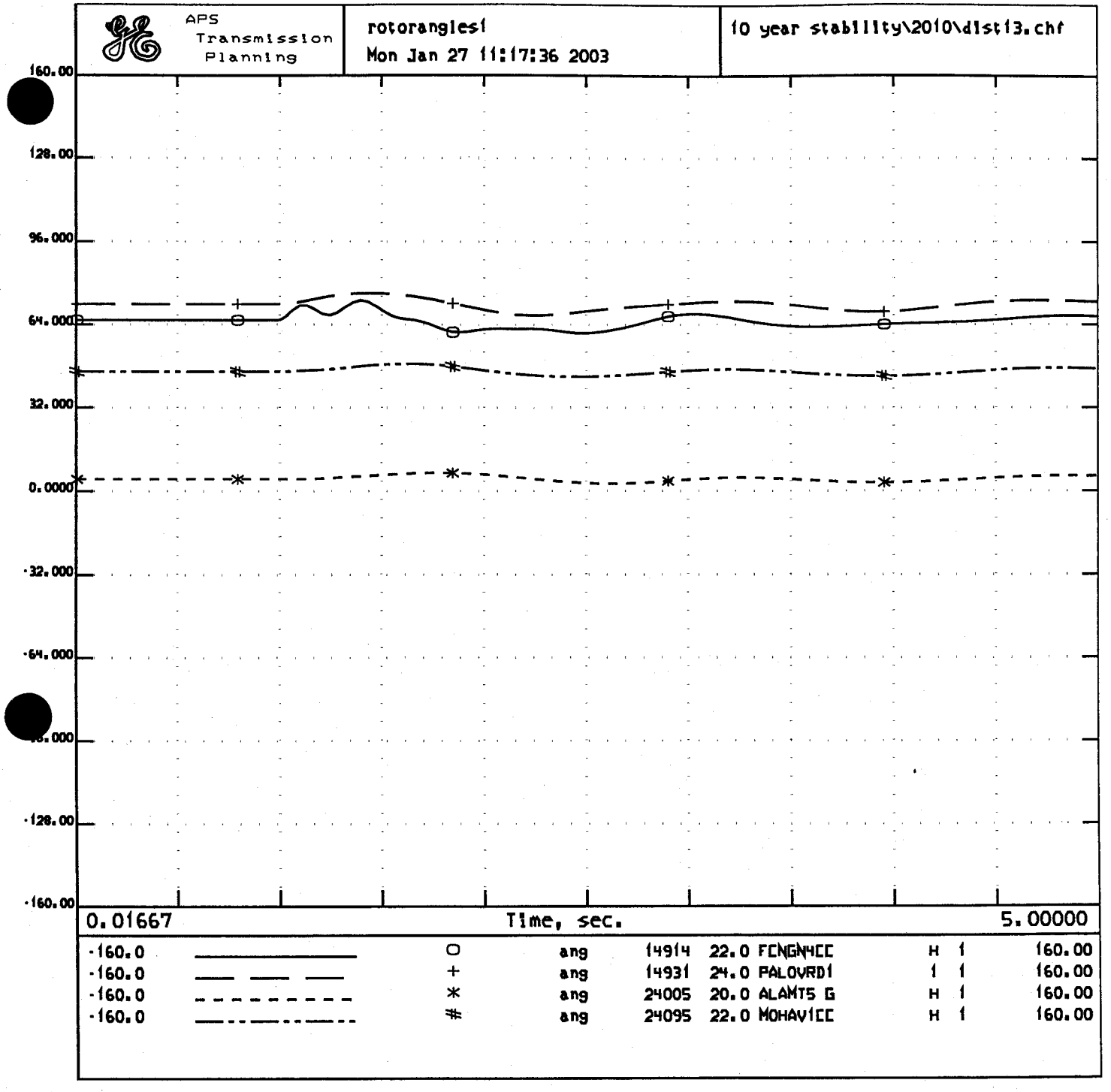
CHOLLA 500KV FLT CH-COR LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
CHO-COR STAB; 1/03; T=0 3P FLT CHO500;4C CLR FLT
W/CHO-COR;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



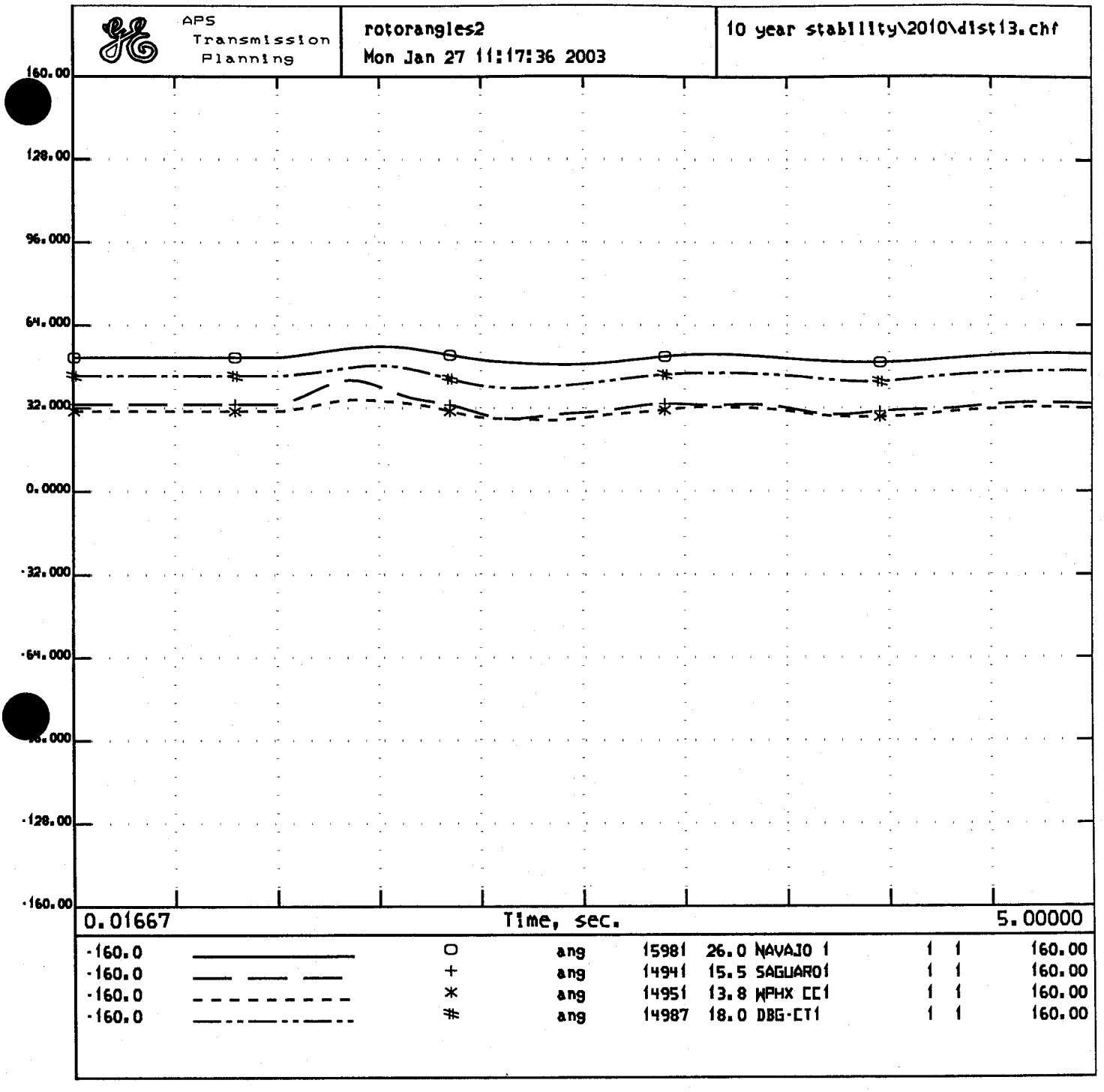
CHOLLA 500KV FLT CH-COR LINE OUT
Originally the 2007 HSIA APPROVED BASE CASE
NOVEMBER 13, 2002
CHO-COR STAB; 1/03; T=0 3P FLT CHO500;4C CLR FLT
W/CHO-COR;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



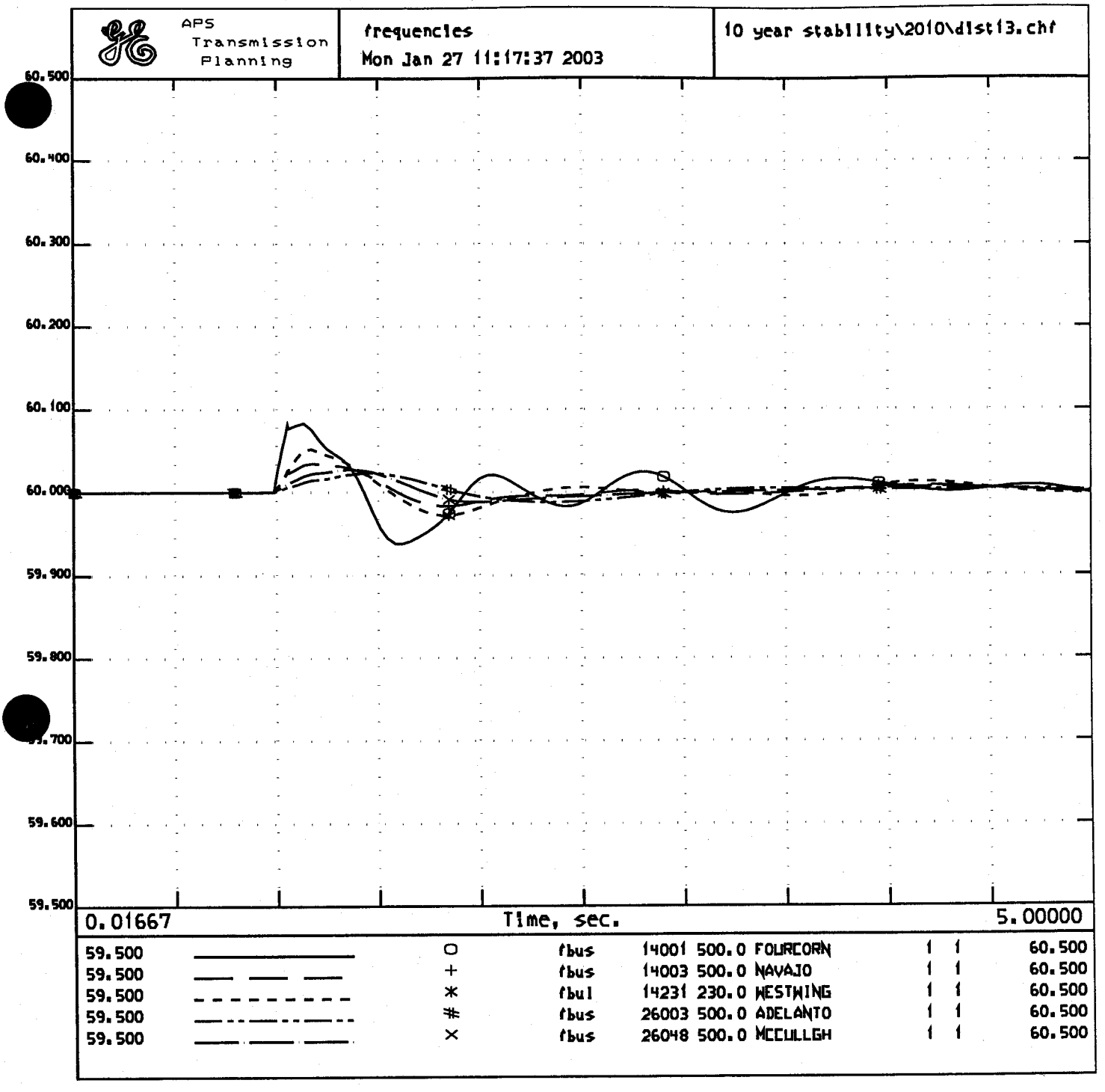
CHOLLA 500KV FLT CH-COR LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
CHO-COR STAB; 1/03; T=0 3P FLT CHO500;4C CLR FLT
W/CHO-COR;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



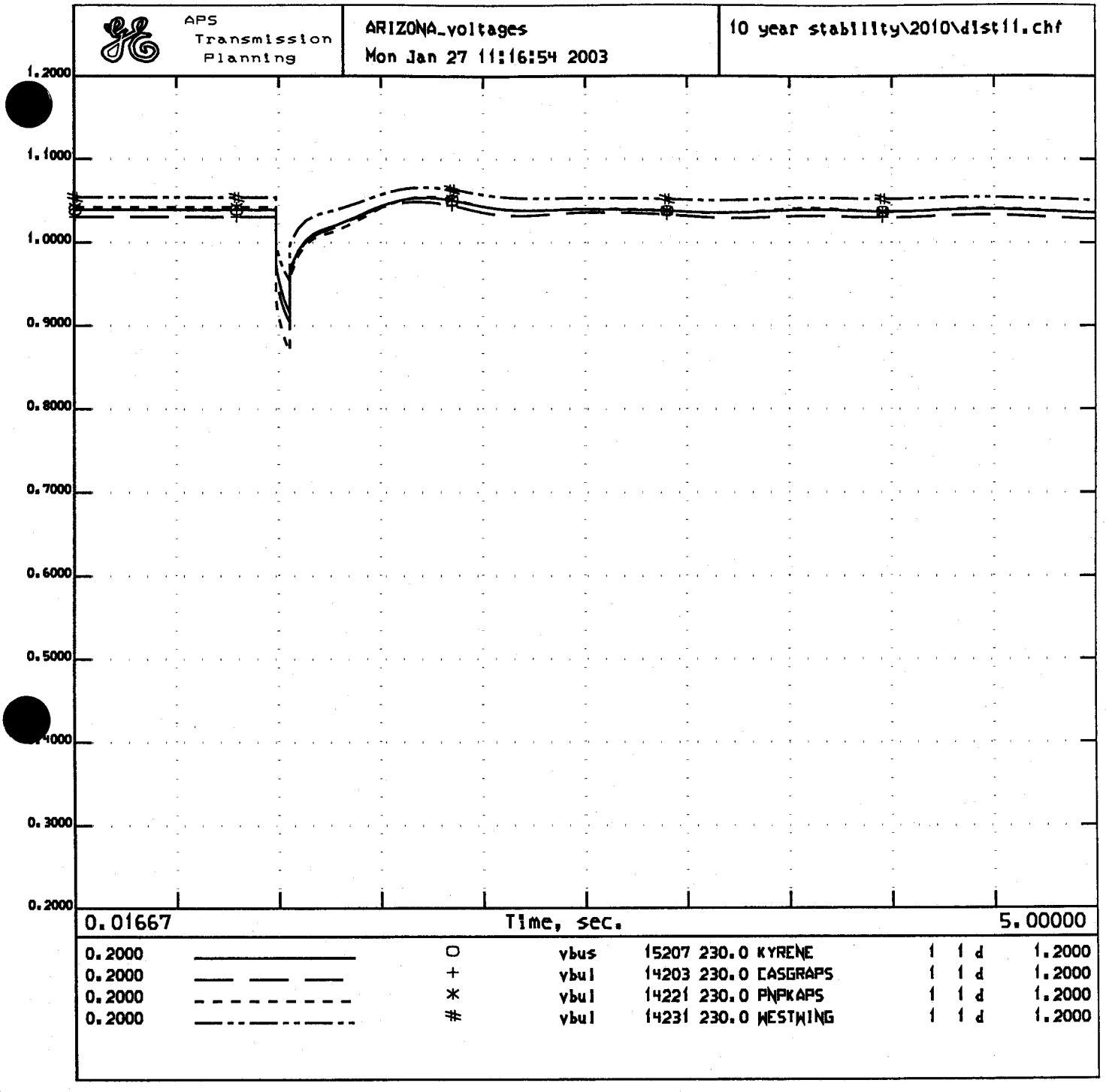
CHOLLA 500KV FLT CH-COR LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
CHO-COR STAB; 1/03; T=0 3P FLT CHO500;4C CLR FLT
W/CHO-COR;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



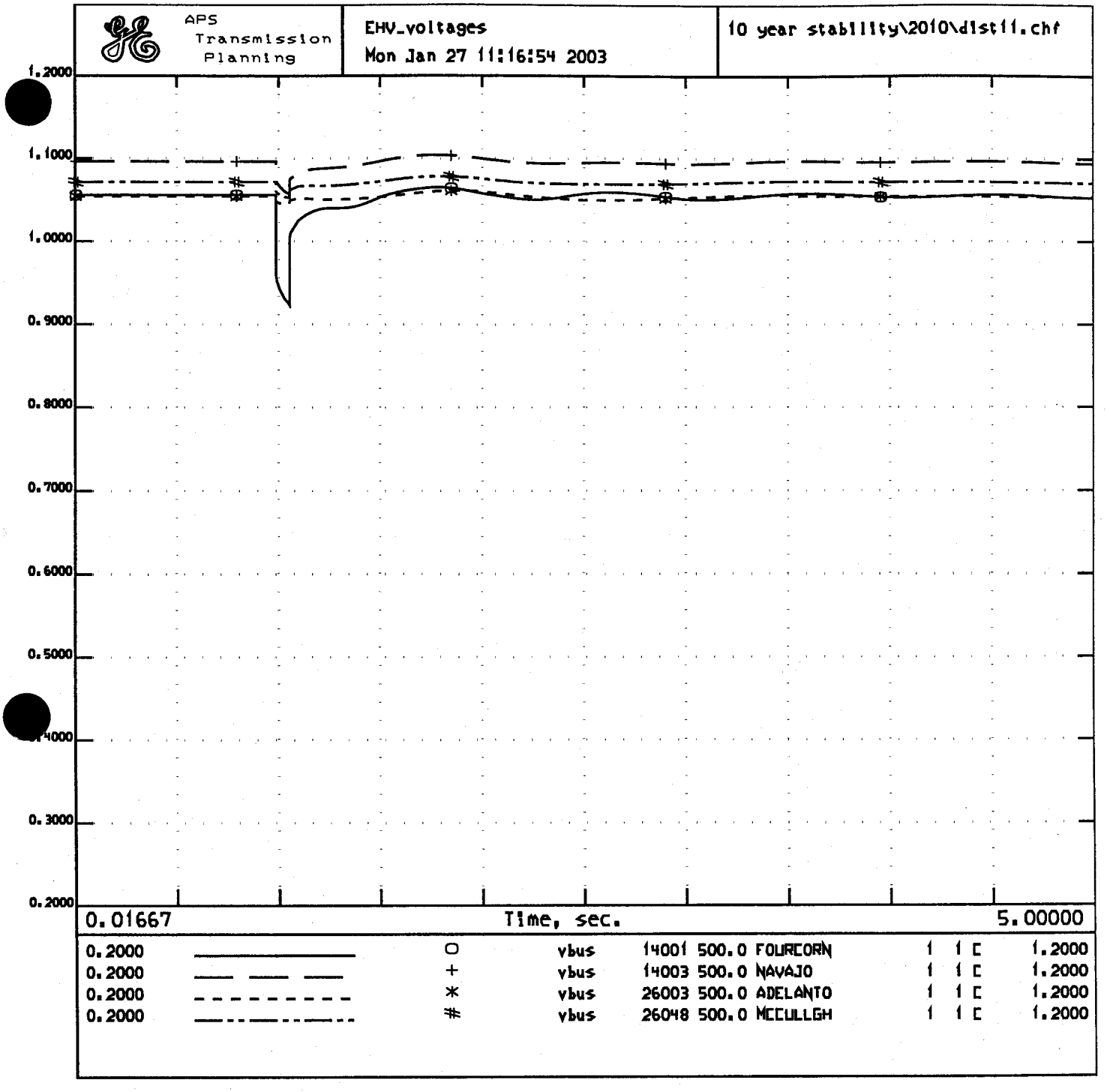
CHOLLA 500KV FLT CH-COR LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
CHO-COR STAB; 1/03; T=0 3P FLT CHO500;4C CLR FLT
W/CHO-COR;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



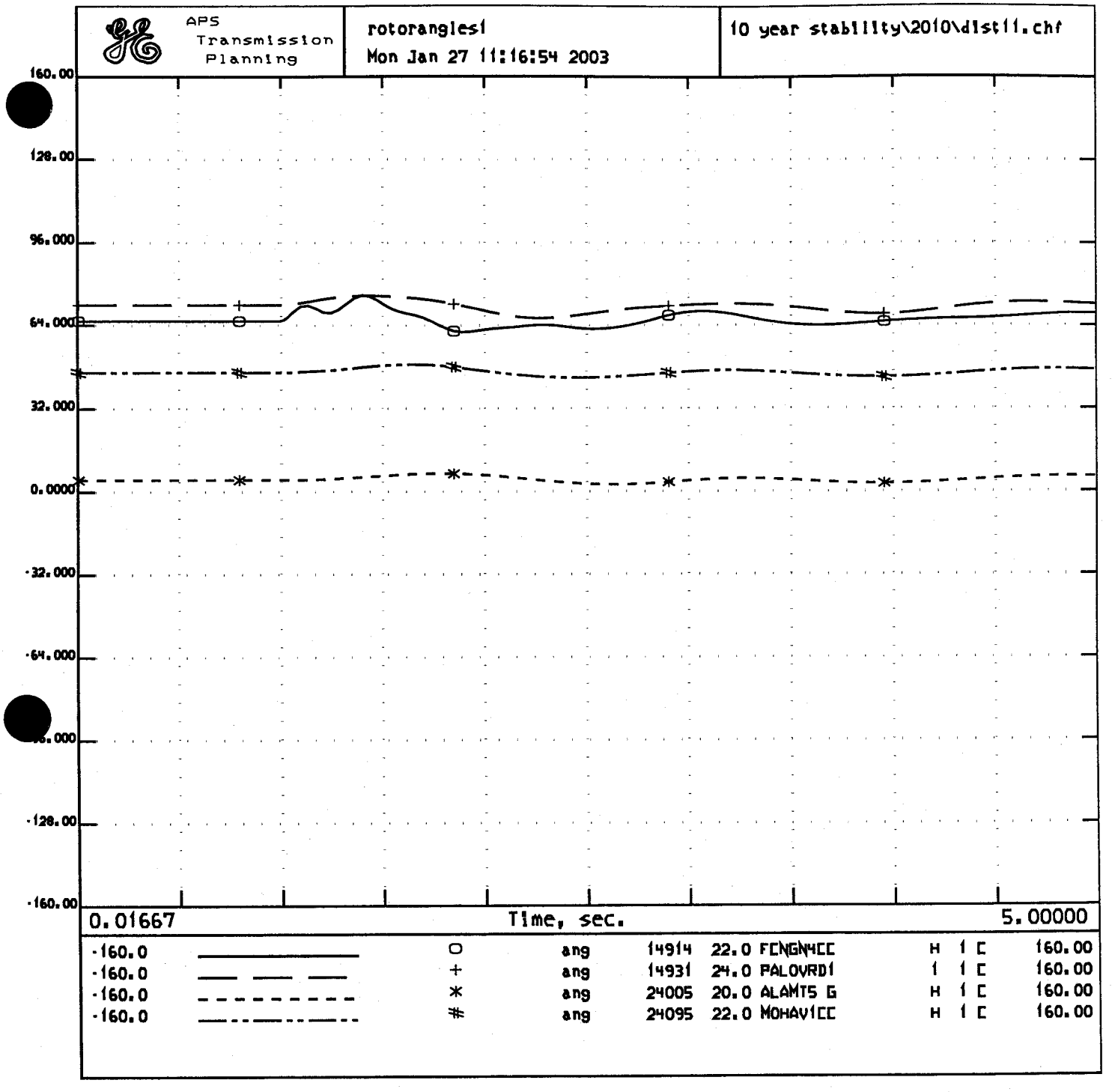
CHOLLA 500KV FLT CH-SLVRKG LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
CHO-SLVRKG STAB; 1/03; T=0 3P FLT CHO500;4C CLR FLT
W/CHO-SKX;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



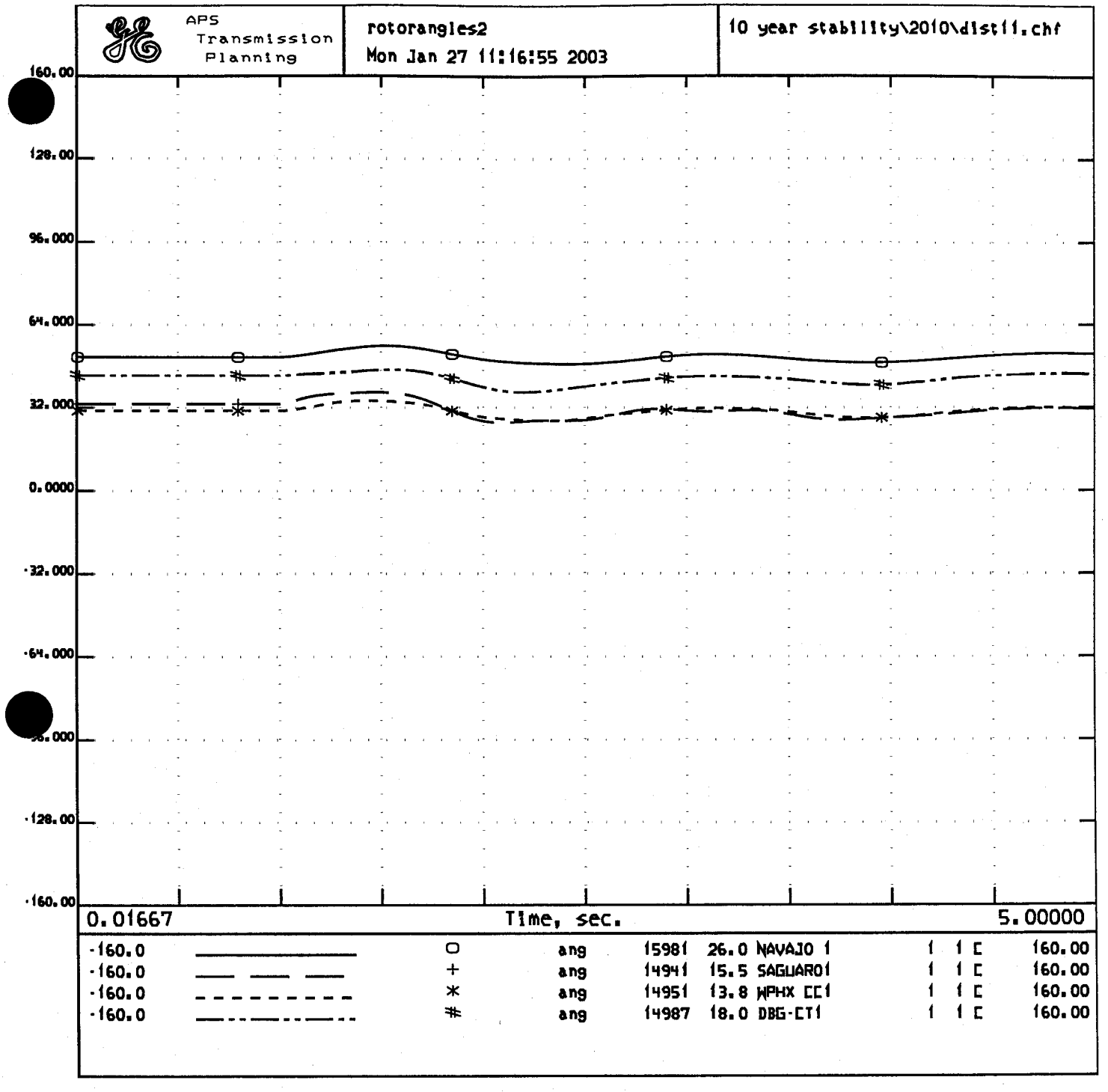
CHOLLA 500KV FLT CH-SLVRKG LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
CHO-SLVRKG STAB; 1/03; T=0 3P FLT CHO500;4C CLR FLT
W/CHO-SKX;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



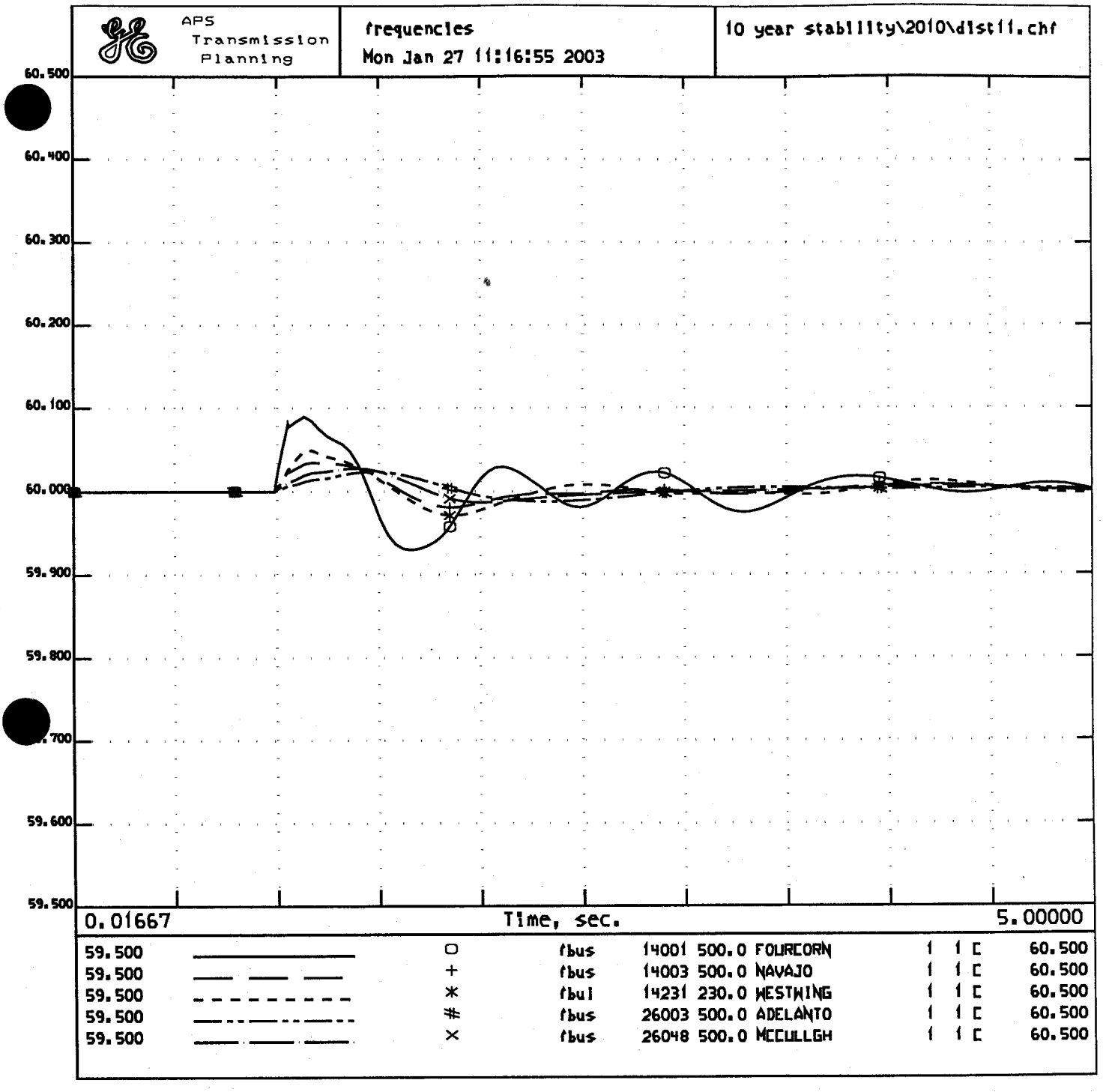
CHOLLA 500KV FLT CH-SLVRKG LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
CHO-SLVRKG STAB; 1/03; T=0 3P FLT CHO500;4C CLR FLT
W/CHO-SKX;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



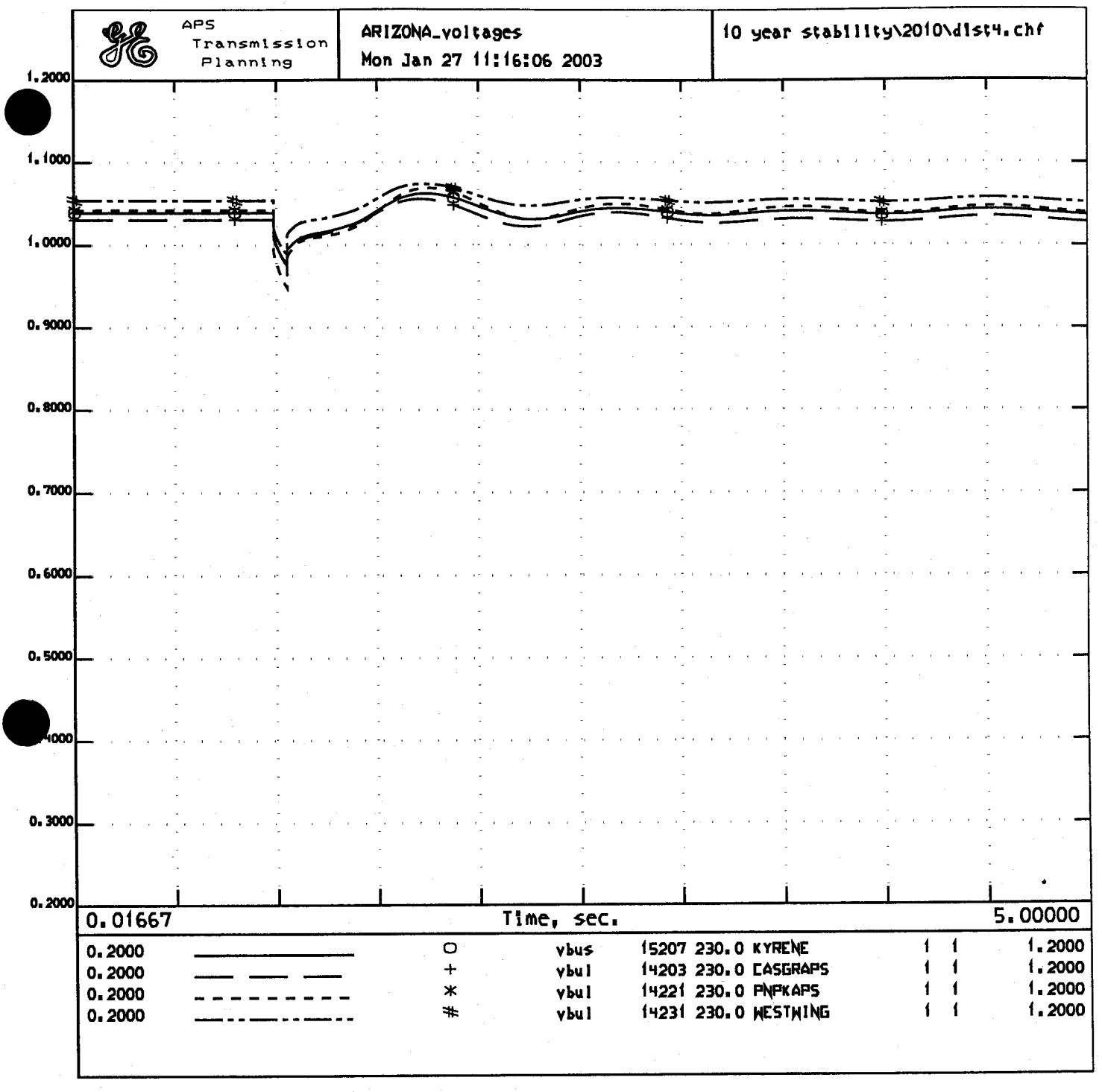
CHOLLA 500KV FLT CH-SLVRKG LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
CHO-SLVRKG STAB; 1/03; T=0 3P FLT CHO500;4C CLR FLT
W/CHO-SKX;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



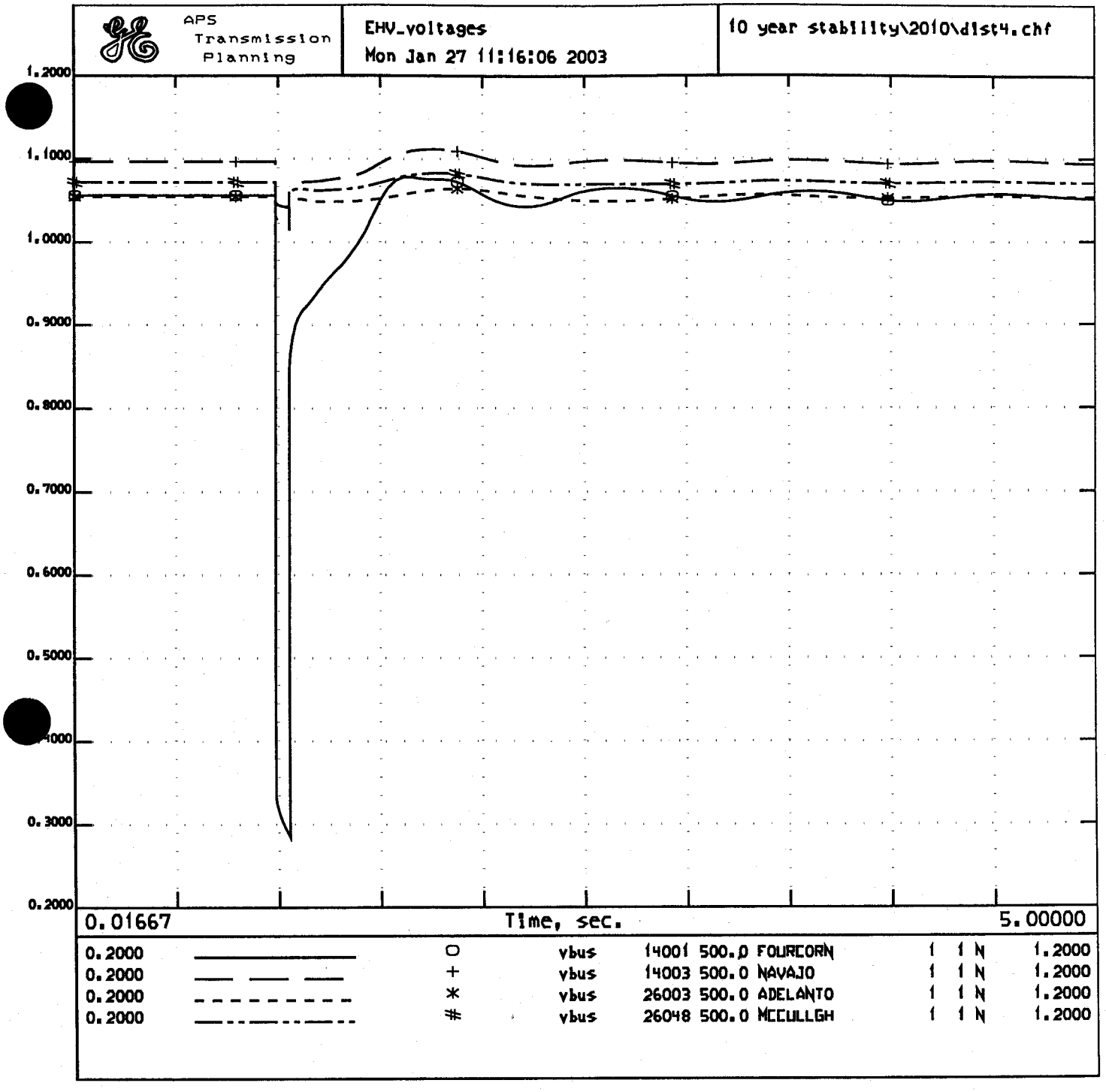
CHOLLA 500KV FLT CH-SLVRKG LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
CHO-SLVRKG STAB; 1/03; T=0 3P FLT CHO500;4C CLR FLT
W/CHO-SKX;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



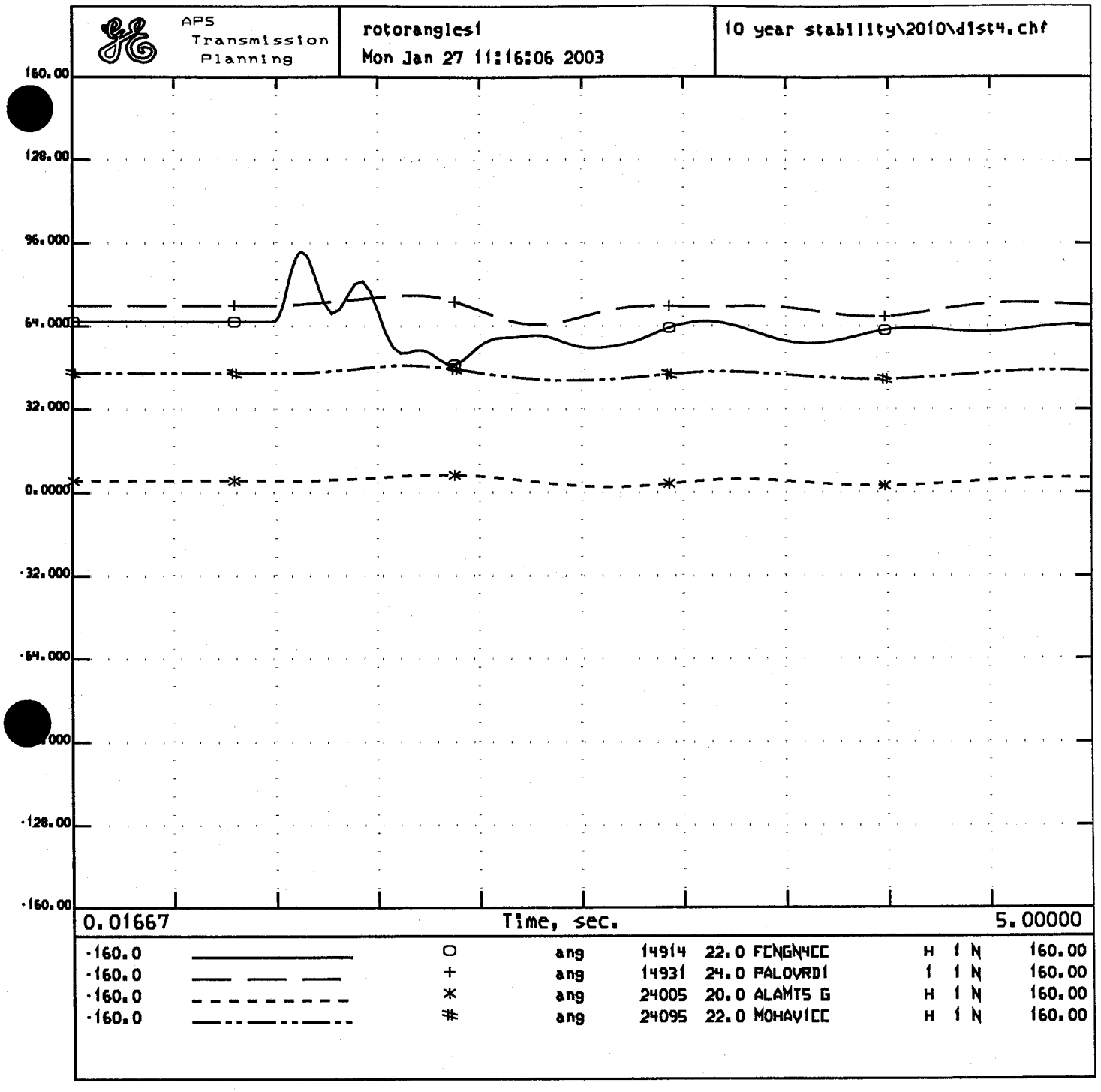
FCN345 fault with FCN-CHOLLA line out
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
FCN-CHO #1 STAB; 1/03 T=0 3P FLT FCN345;10% FLT DMPING;FLSH
CAPS FCN-CHO;4C CLR FLT W/FCN-CHO #1; 8C REIN CAPS;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



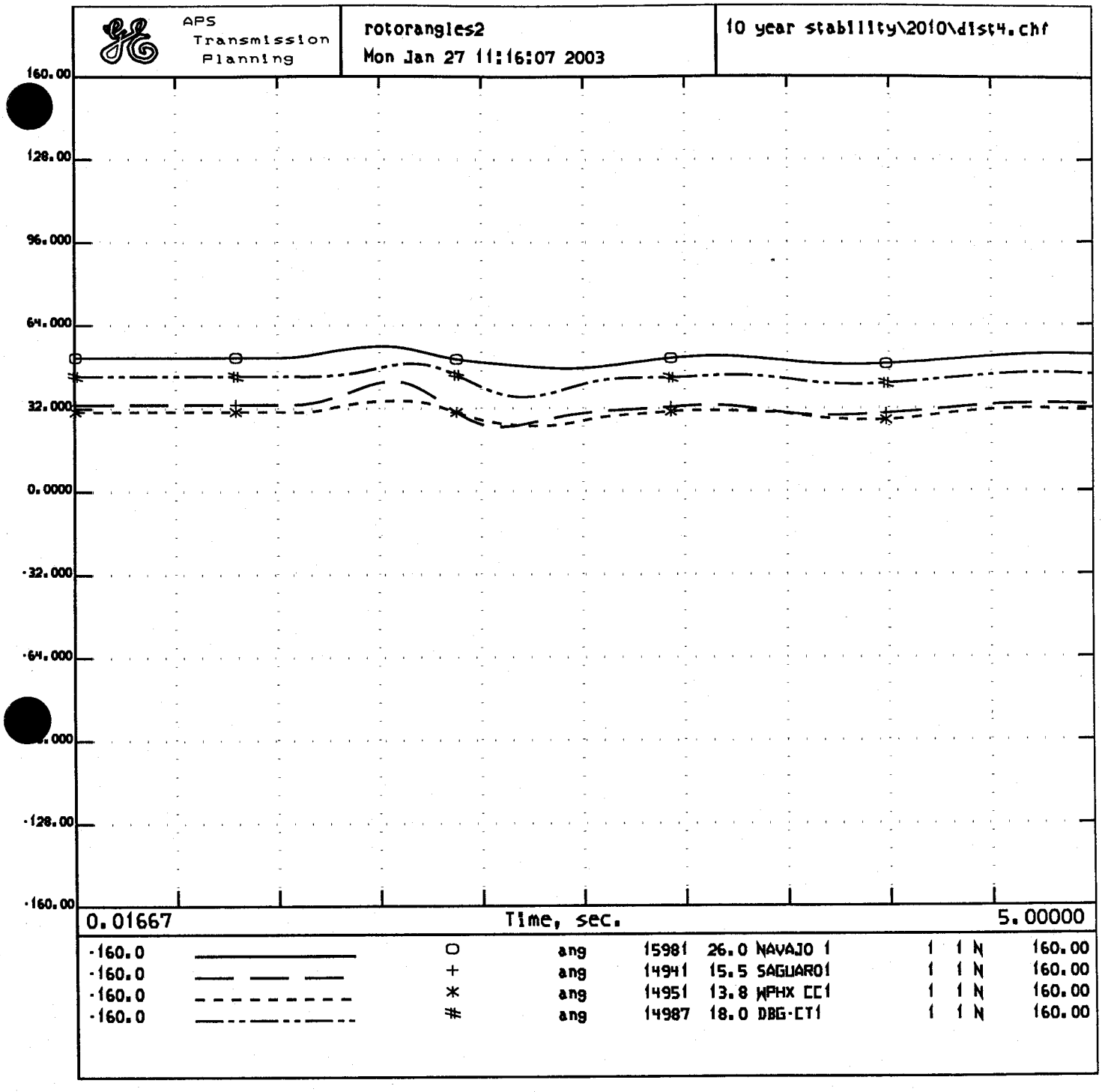
FCN345 fault with FCN-CHOLLA line out
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
FCN-CHO #1 STAB; 1/03 T=0 3P FLT FCN345;10% FLT DMPING;FLSH
CAPS FCN-CHO;4C CLR FLT W/FCN-CHO #1; 8C REIN CAPS;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



FCN345 fault with FCN-CHOLLA line out
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
FCN-CHO #1 STAB; 1/03 T=0 3P FLT FCN345;10% FLT DMPING;FLSH
CAPS FCN-CHO;4C CLR FLT W/FCN-CHO #1; 8C REIN CAPS;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



FCN345 fault with FCN-CHOLLA line out
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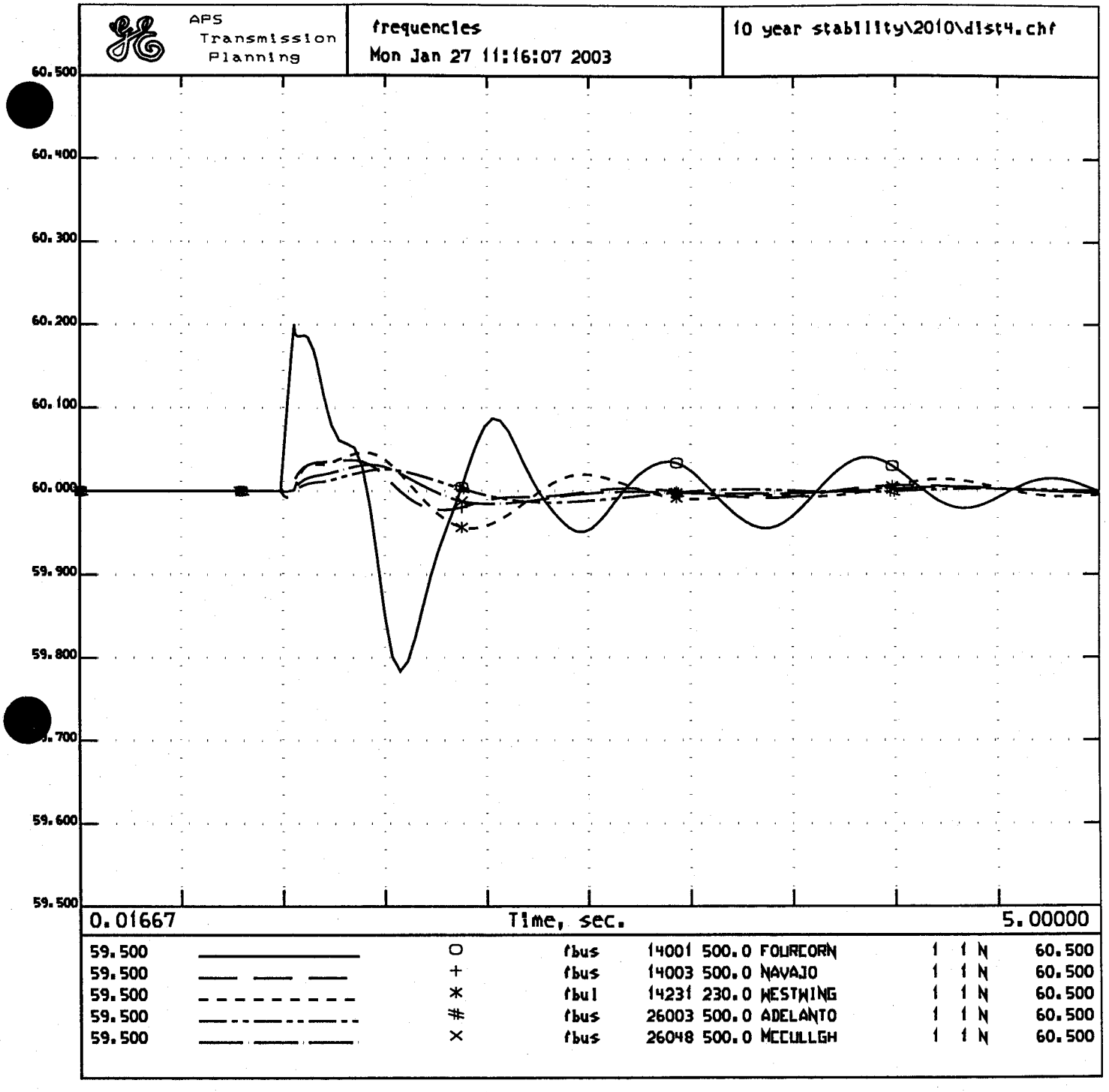
NOVEMBER 13, 2002
FCN-CHO #1 STAB; 1/03 T=0 3P FLT FCN345;10% FLT DMPING;FLSH
CAPS FCN-CHO;4C CLR FLT W/FCN-CHO #1; 8C REIN CAPS;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



FCN345 fault with FCN-CHOLLA line out
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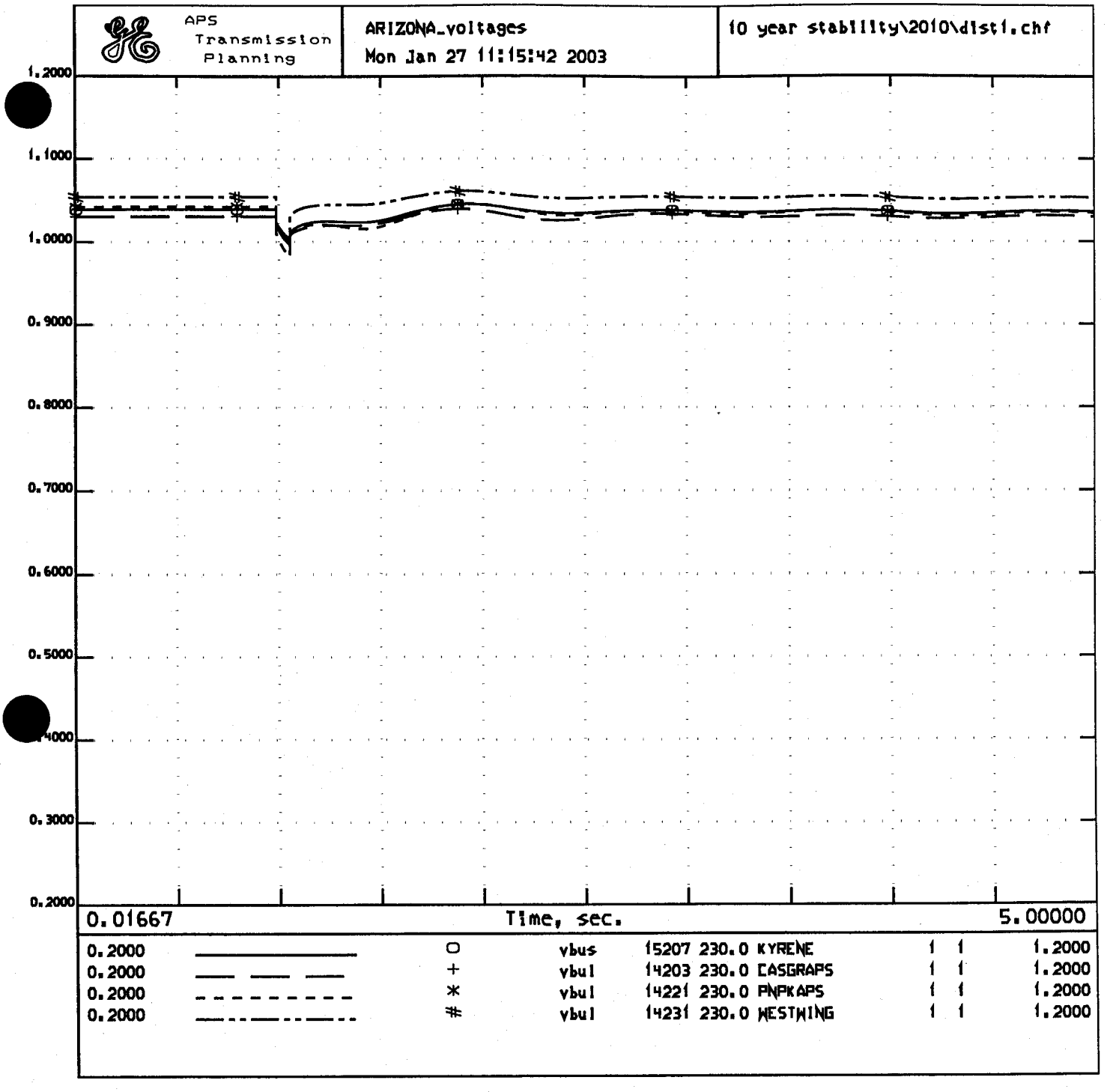
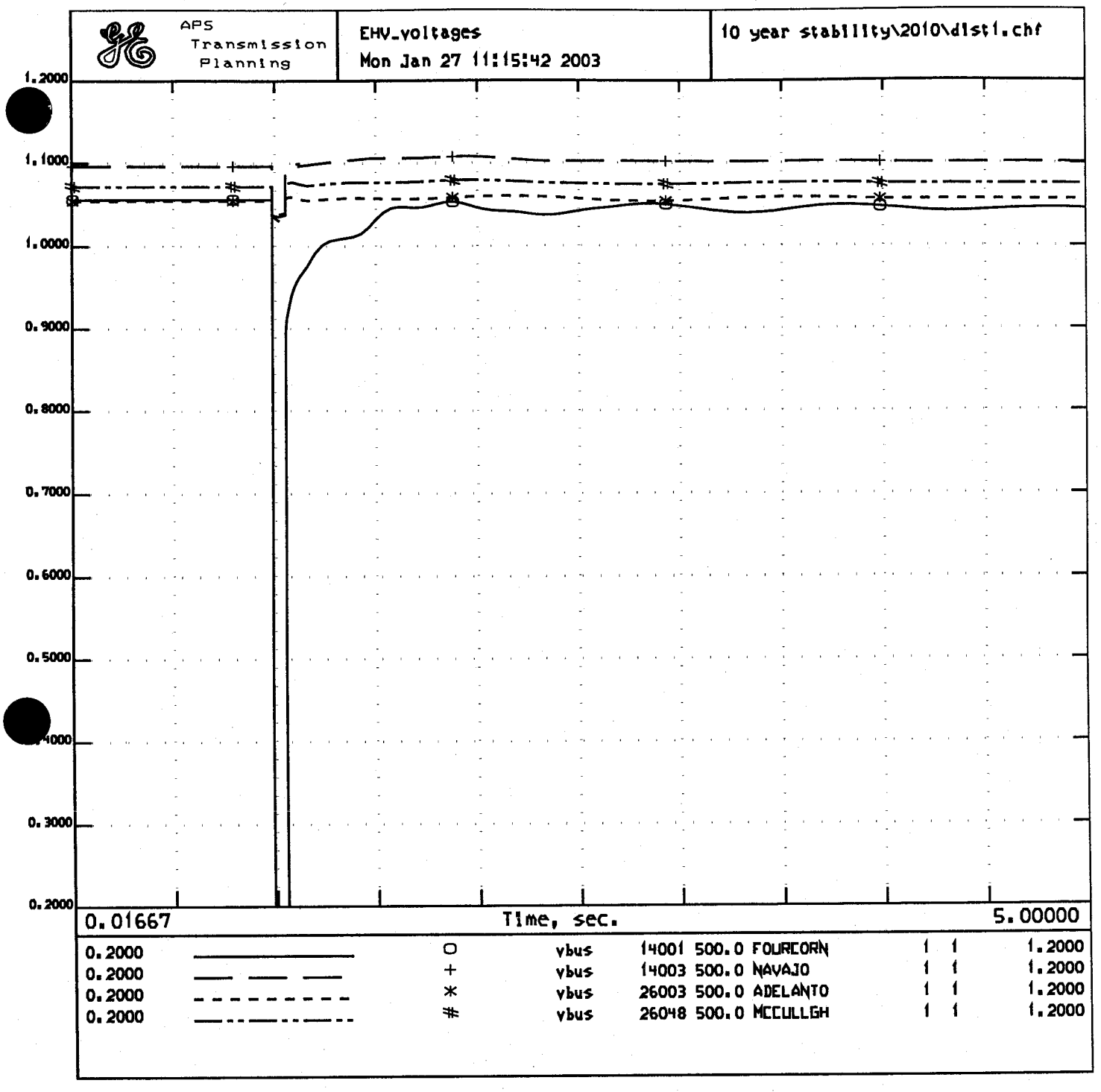
Updated the loads to 2010 level.



FCN FLT500 FCN-MNK out
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
FOURCORN-MOENKOPI STAB; 1/03; T=0 3P FLT FCN500;10% FLT DMPING;FLSH
CAPS FCN-MKP/NAV-MKP;4C CLR FLT W/FCN-MKP;8C REIN CAPS;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



FCN FLT500 FCN-MNK out
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
FOURCORN-MOENKOPI STAB; 1/03; T=0 3P FLT FCN500;10% FLT DMPING;FLSH
CAPS FCN-MKP/NAV-MKP;4C CLR FLT W/FCN-MKP;8C REIN CAPS;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
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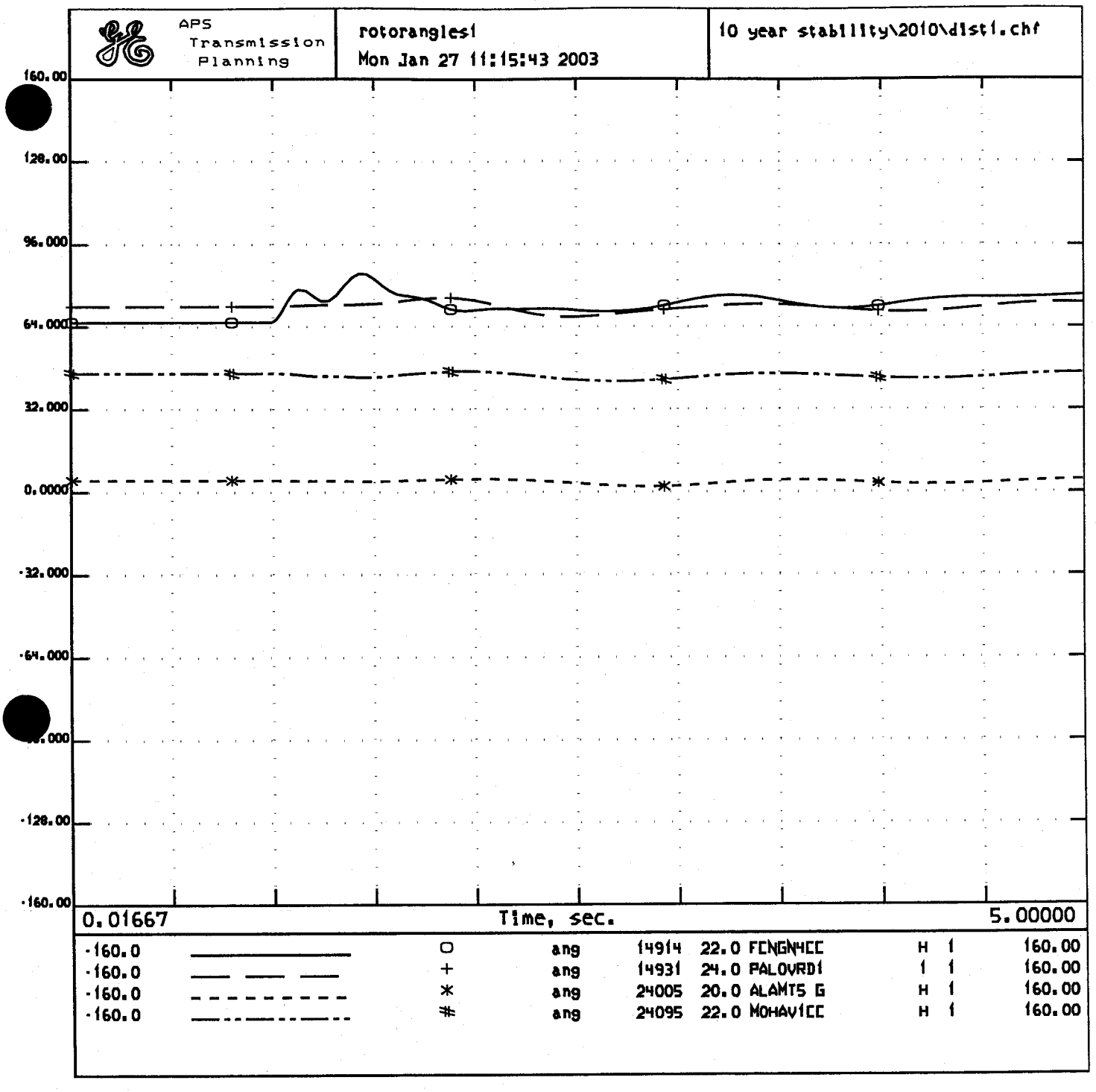

FCN FLT500 FCN-MNK out
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
FOURCORN-MOENKOPI STAB; 1/03; T=0 3P FLT FCN500;10% FLT DMPING;FLSH
CAPS FCN-MKP/NAV-MKP;4C CLR FLT W/FCN-MKP;8C REIN CAPS;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
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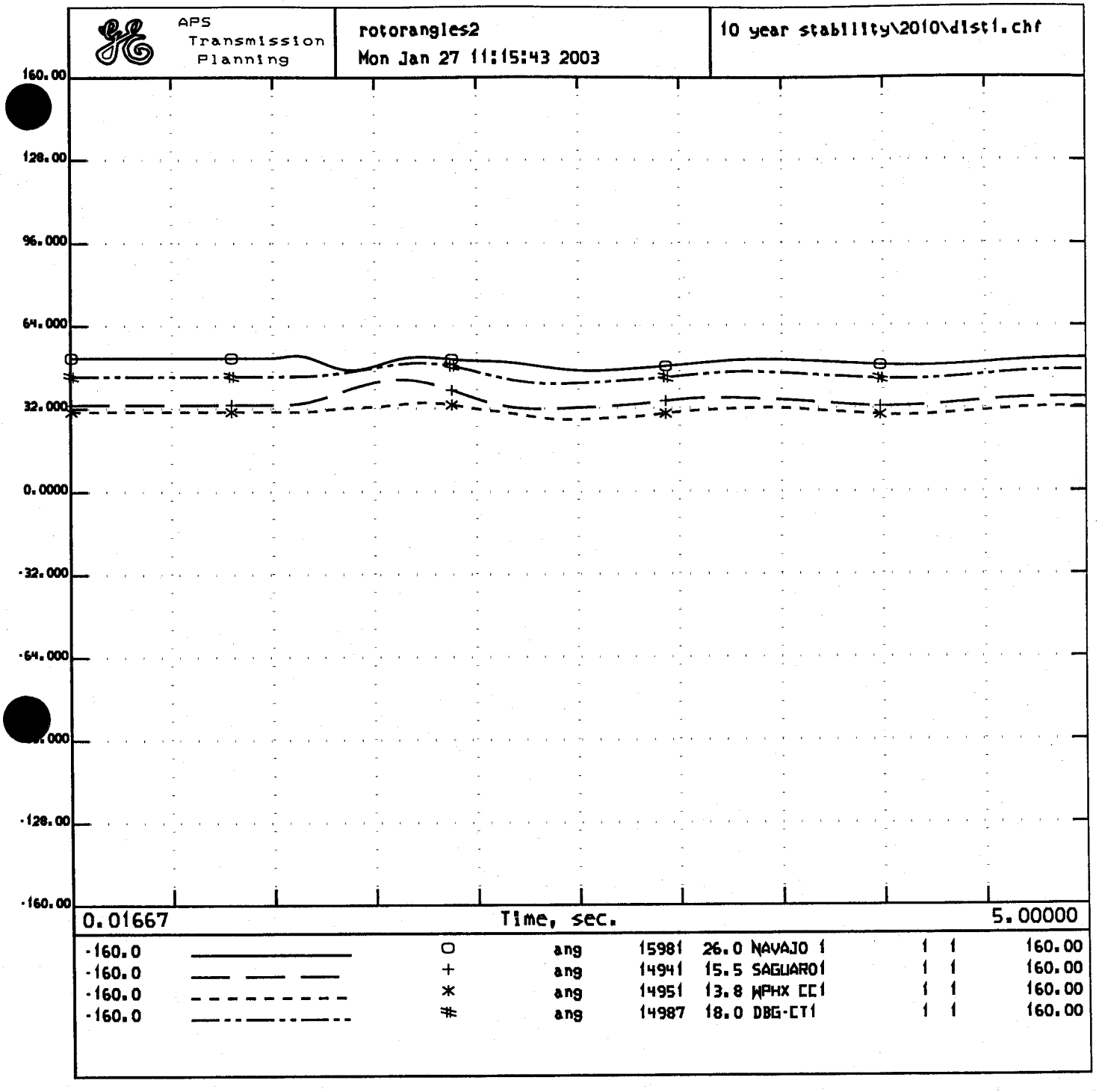

FCN FLT500 FCN-MNK out
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
FOURCORN-MOENKOPI STAB; 1/03; T=0 3P FLT FCN500;10% FLT DMPING;FLSH
CAPS FCN-MKP/NAV-MKP;4C CLR FLT W/FCN-MKP;8C REIN CAPS;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
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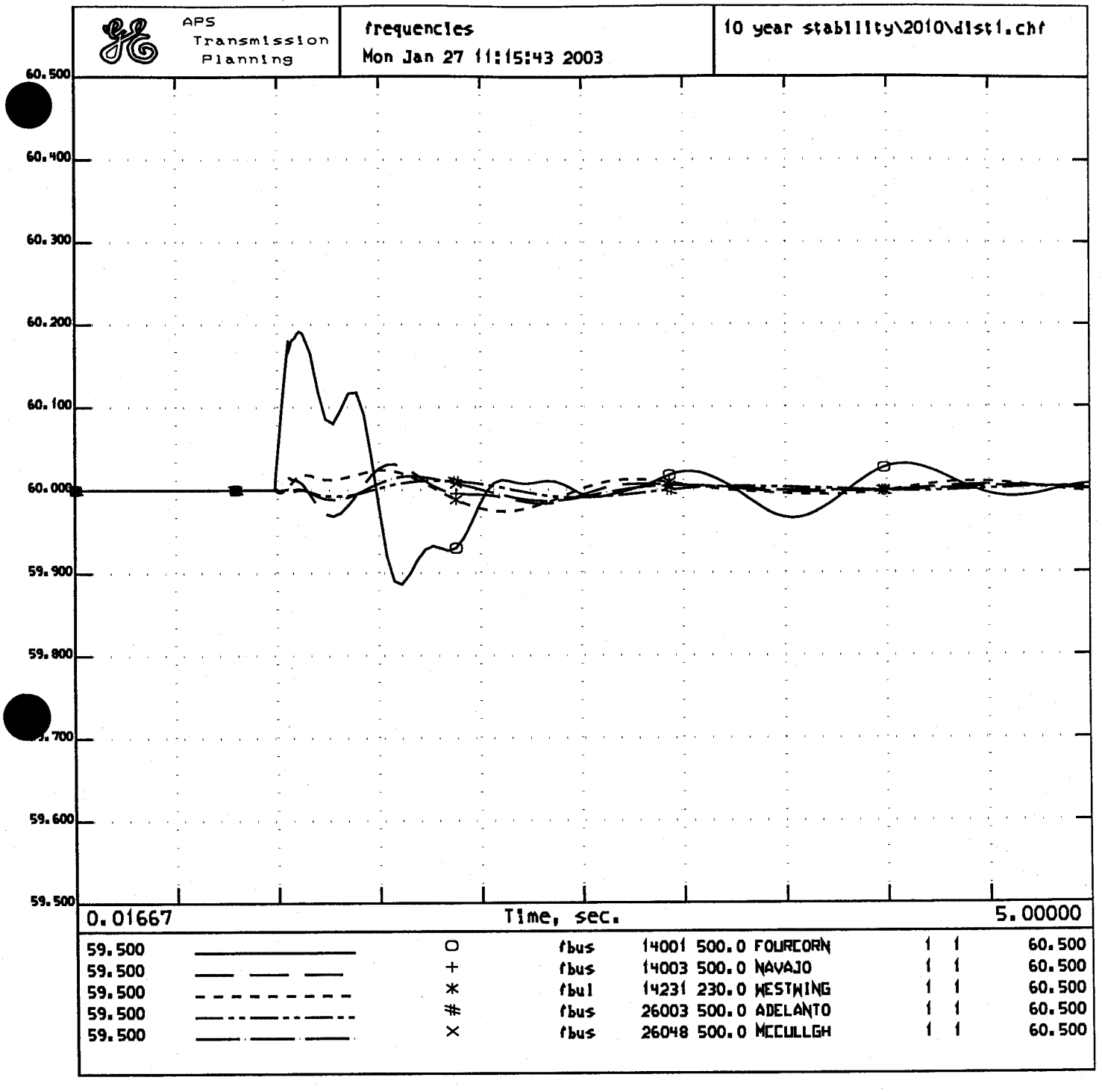

FCN FLT500 FCN-MNK out
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NOVEMBER 13, 2002
FOURCORN-MOENKOPI STAB; 1/03; T=0 3P FLT FCN500;10% FLT DMPING;FLSH
CAPS FCN-MKP/NAV-MKP;4C CLR FLT W/FCN-MKP;8C REIN CAPS;2010.dyd;WSCC.bpt

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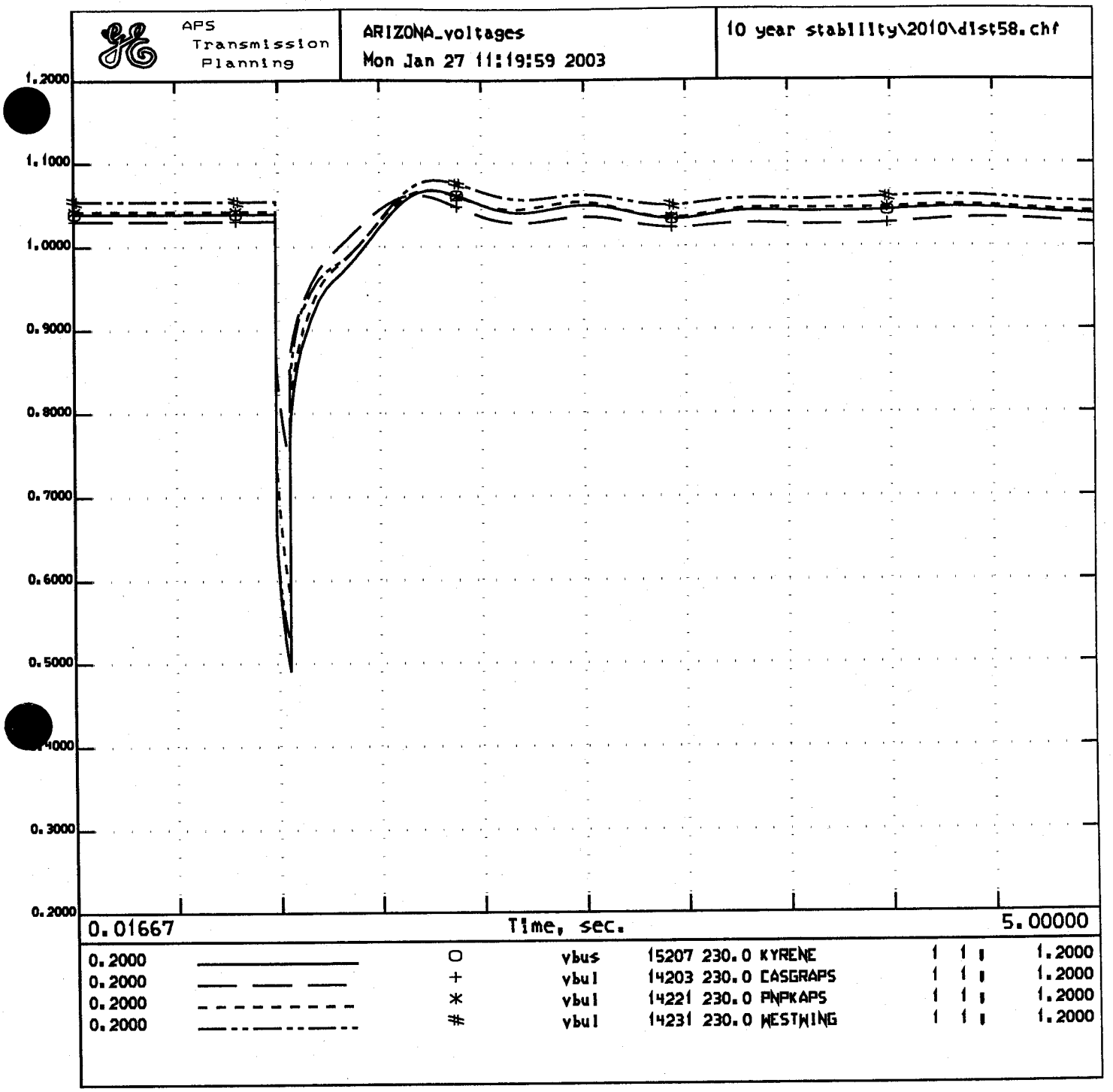
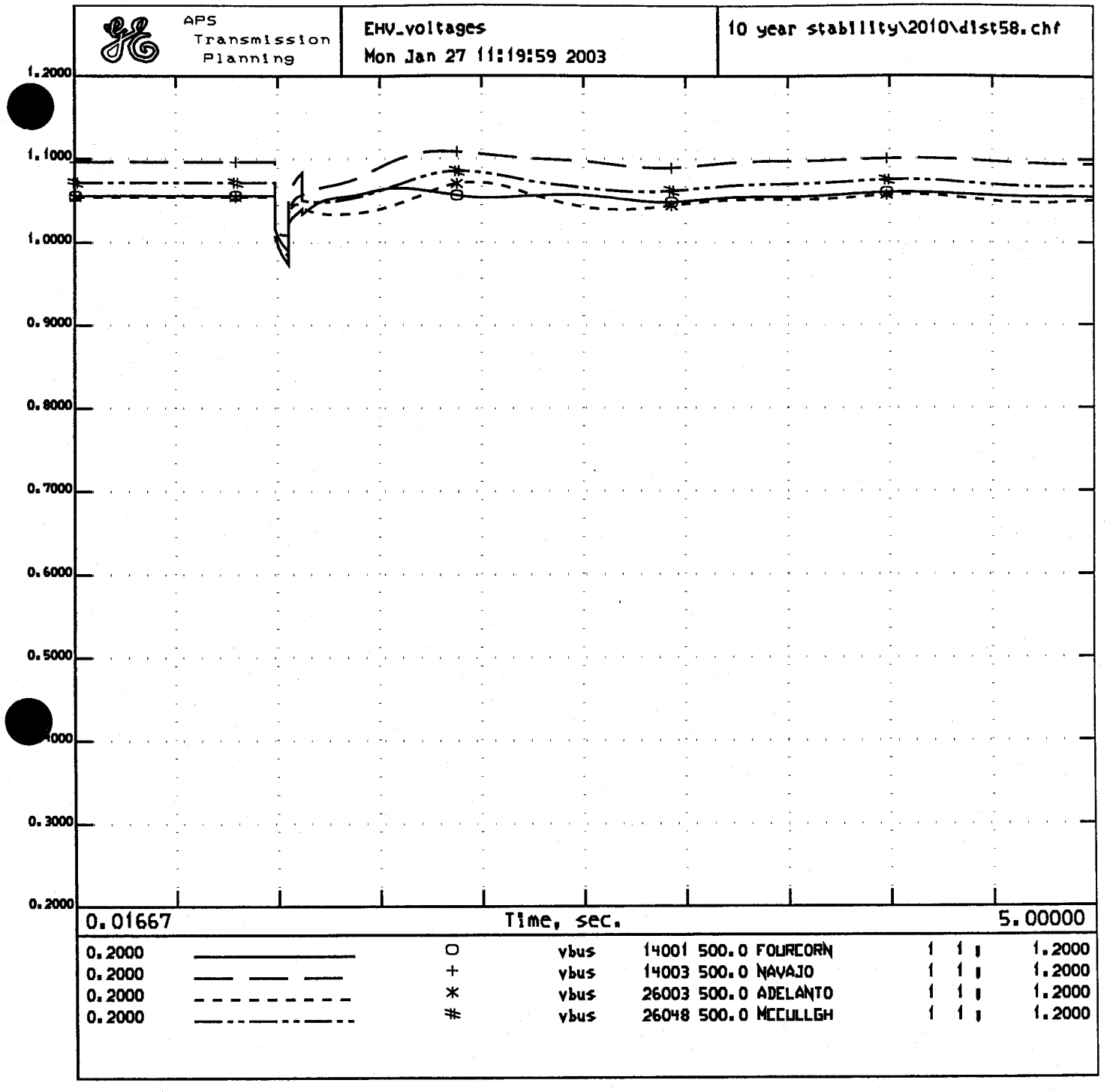


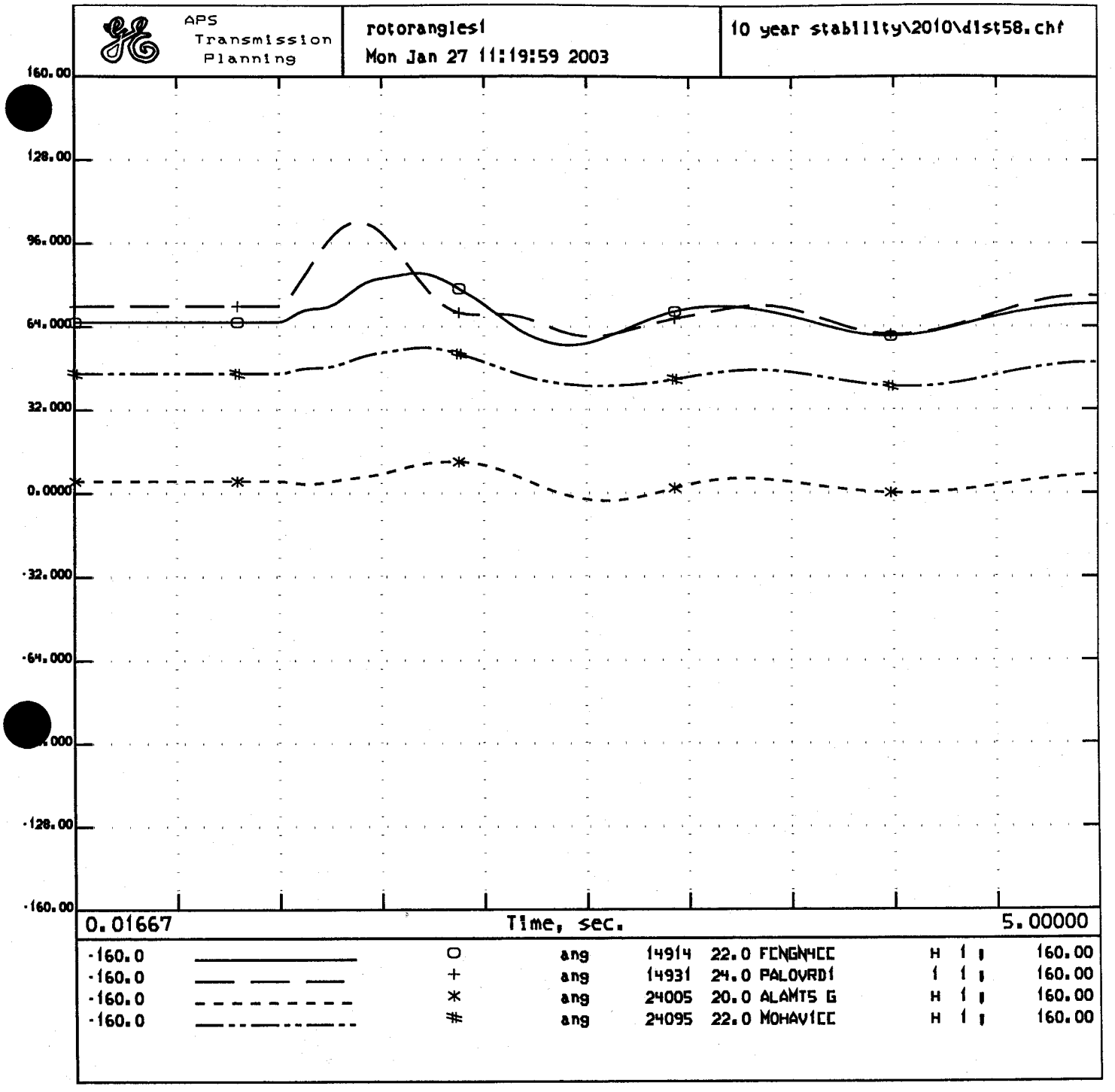
JOJOBA FLT HASSY-JOJOBA LINE OUT
Originally the 2007 HSIA APPROVED BASE CASE
NOVEMBER 13, 2002
HAS-JJ STAB #1; 01/03; T=0 3P FLT JJ500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/HAS-JJ;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



JOJOBA FLT HASSY-JOJOBA LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
HAS-JJ STAB 1; 01/03; T=0 3P FLT JJ500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/HAS-JJ;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



JOJOBA FLT HASSY-JOJOBA LINE OUT
Originally the 2007 HSIA APPROVED BASE CASE
NOVEMBER 13, 2002
HAS-JJ STAB .1; 01/03; T=0 3P FLT JJ500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/HAS-JJ;8C REIN;2010.dyd;WSCC.bpt

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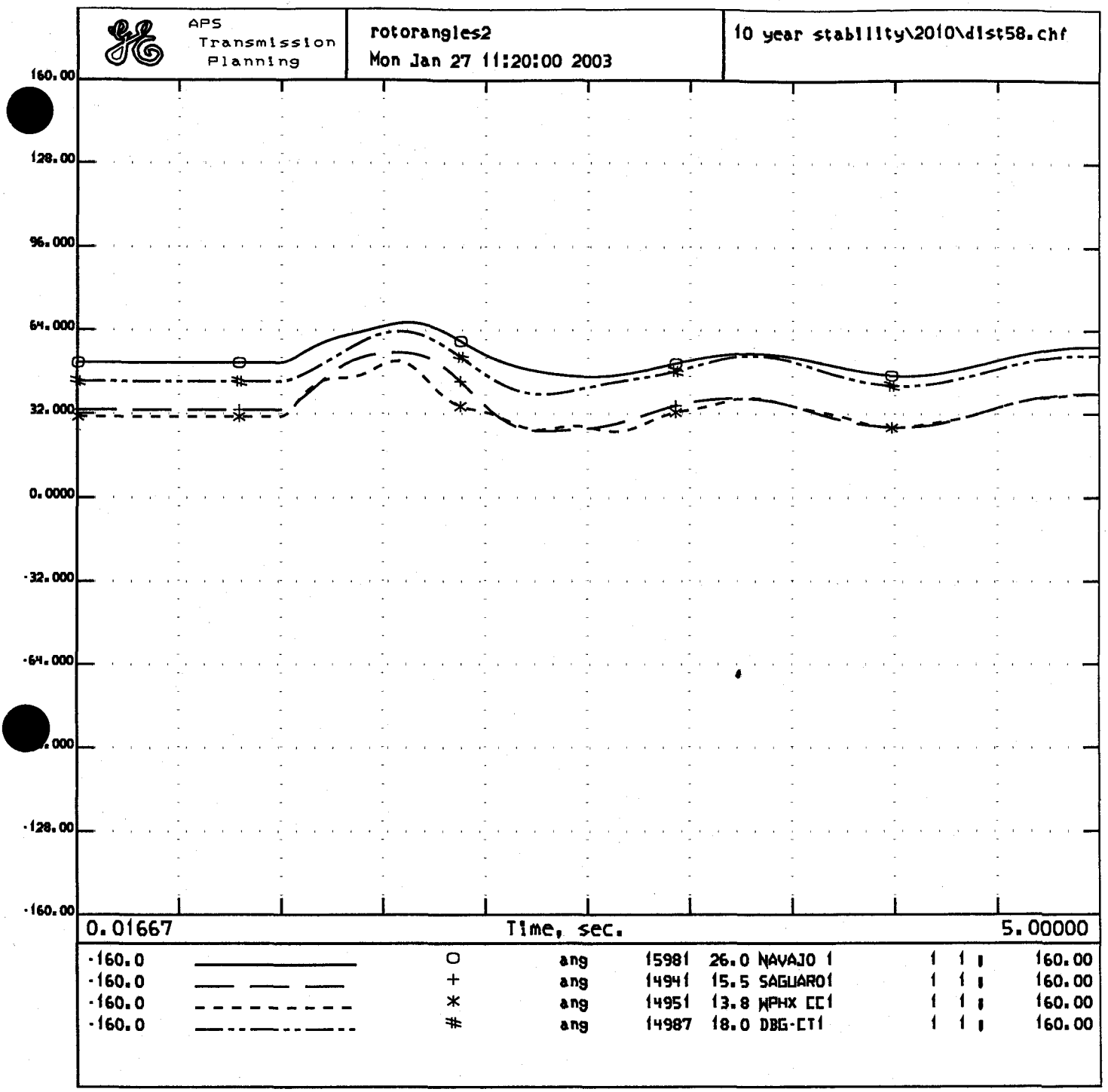
Updated the loads to 2010 level.



JOJOBA FLT HASSY-JOJOBA LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
HAS-JJ STAB #1; 01/03; T=0 3P FLT JJ500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/HAS-JJ;8C REIN;2010.dyd;WSCC.bpt

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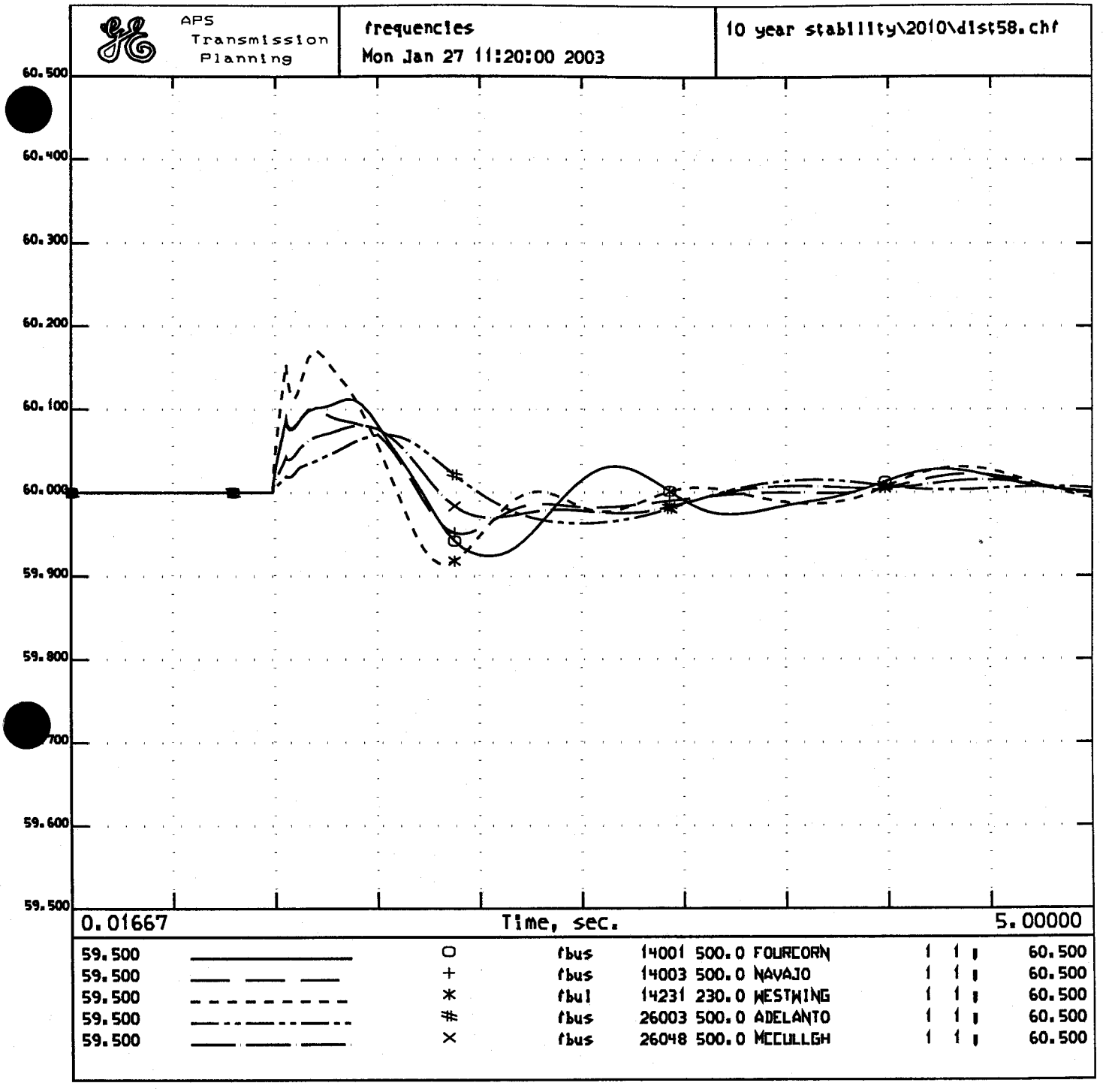

JOJOBA FLT HASSY-JOJOBA LINE OUT
Originally the 2007 HSIA APPROVED BASE CASE
NOVEMBER 13, 2002
HAS-JJ STAB #1; 01/03; T=0 3P FLT JJ500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/HAS-JJ;8C REIN;2010.dyd;WSCC.bpt

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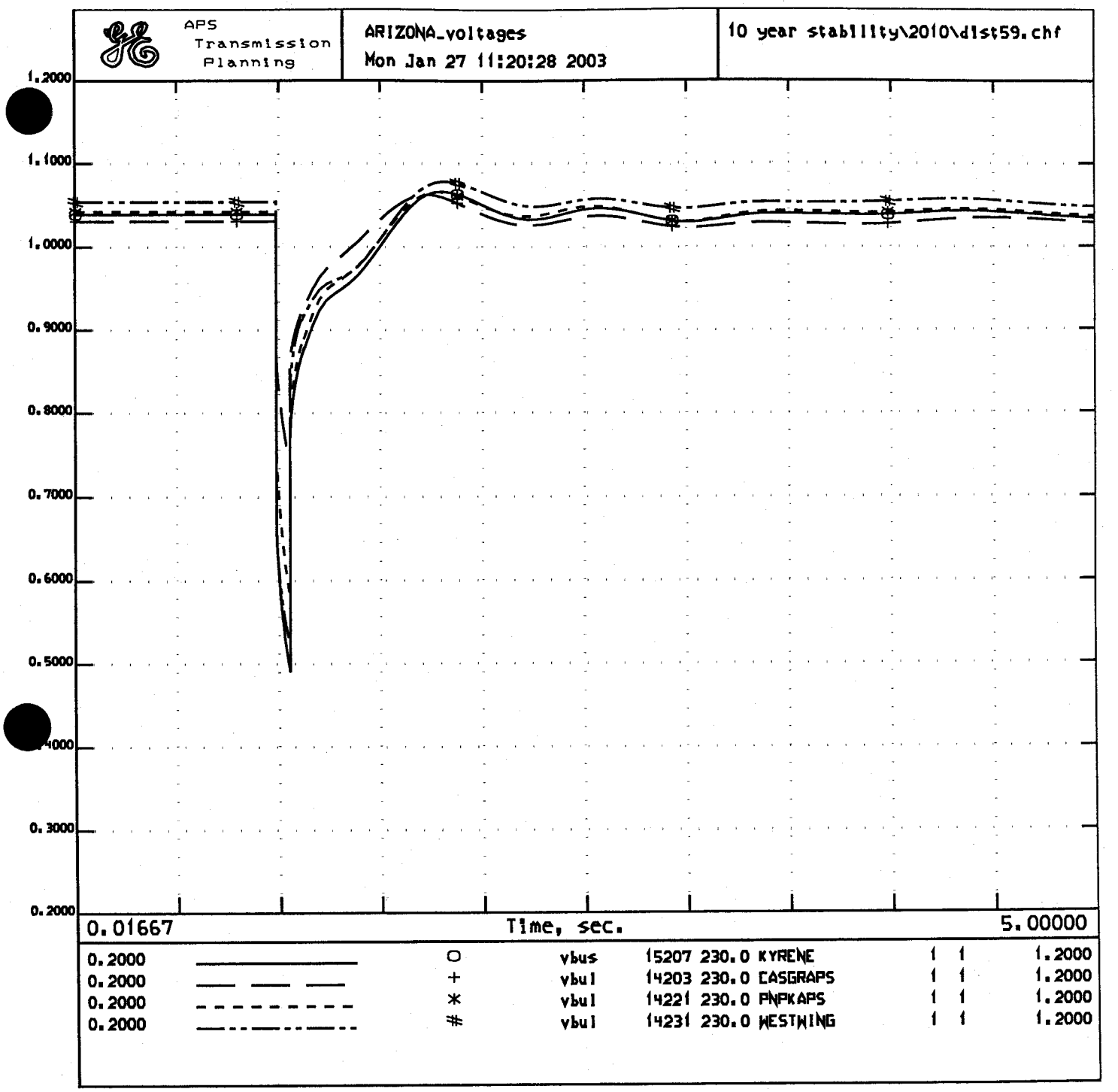


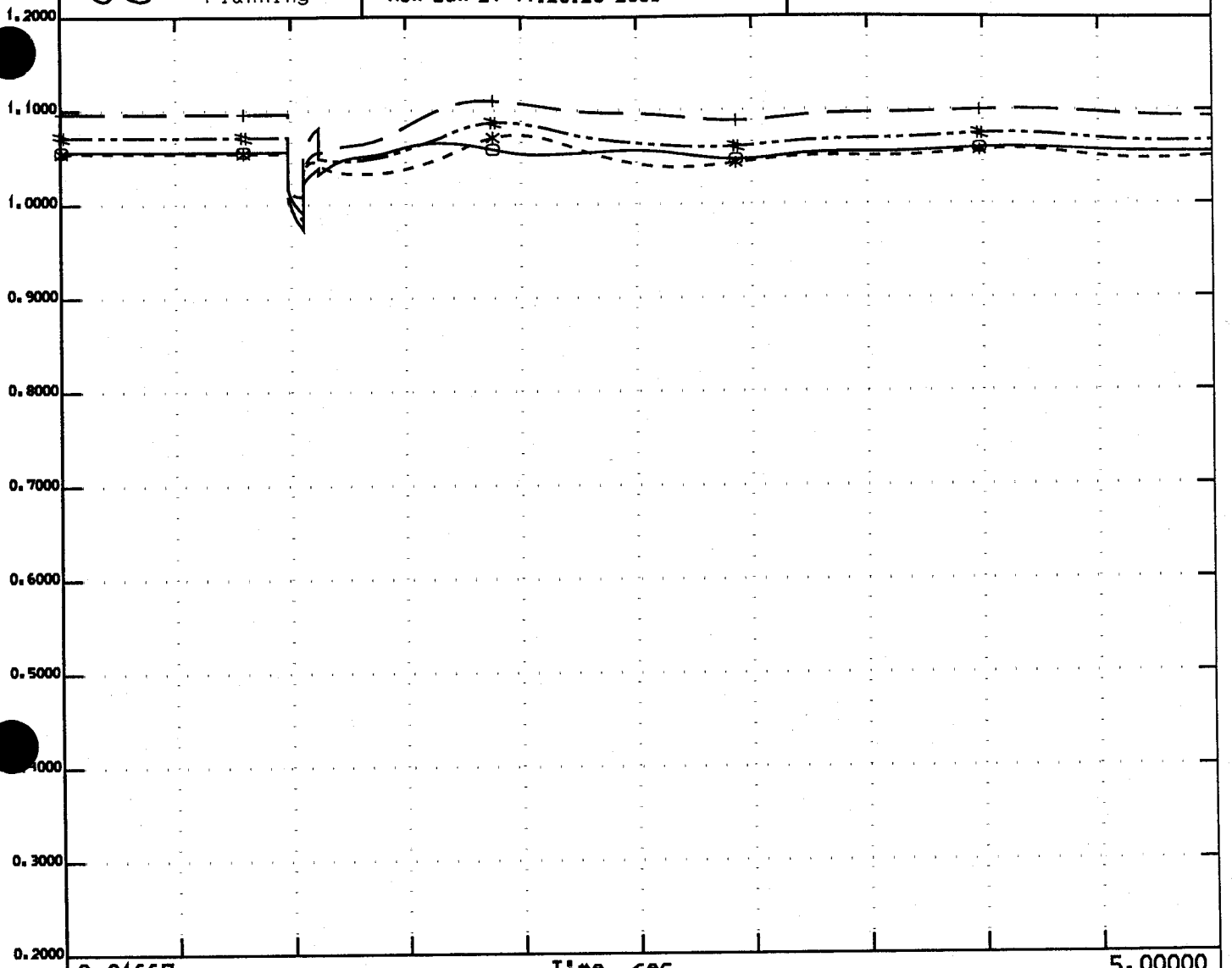
JOJOBA FLT JOJOBA-RUDD LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
JJ-RUDD STAB :1; 01/03; T=0 3P FLT JJ500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/JJ-RUDD;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.

APS Transmission Planning

EHV_voltages
Mon Jan 27 11:20:28 2003

10 year stability\2010\dist59.chf



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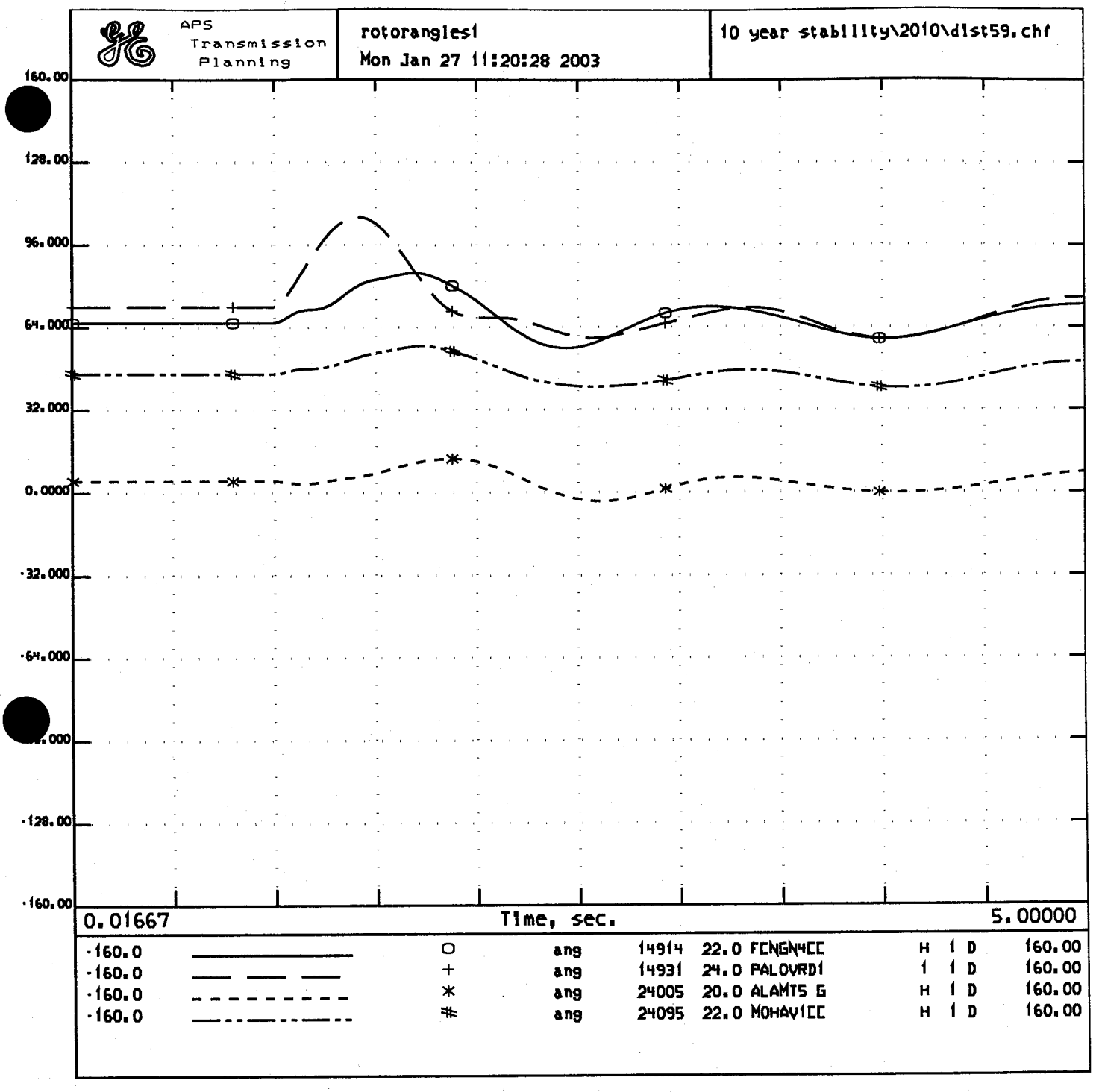
0.2000	— — —	+	vbus	14003	500.0	NAVAJO	1 1 D	1.2000
0.2000	- - - - - -	*	vbus	26003	500.0	ADELANTO	1 1 D	1.2000
0.2000	—-—-—	#	vbus	26048	500.0	MCCULLGH	1 1 D	1.2000

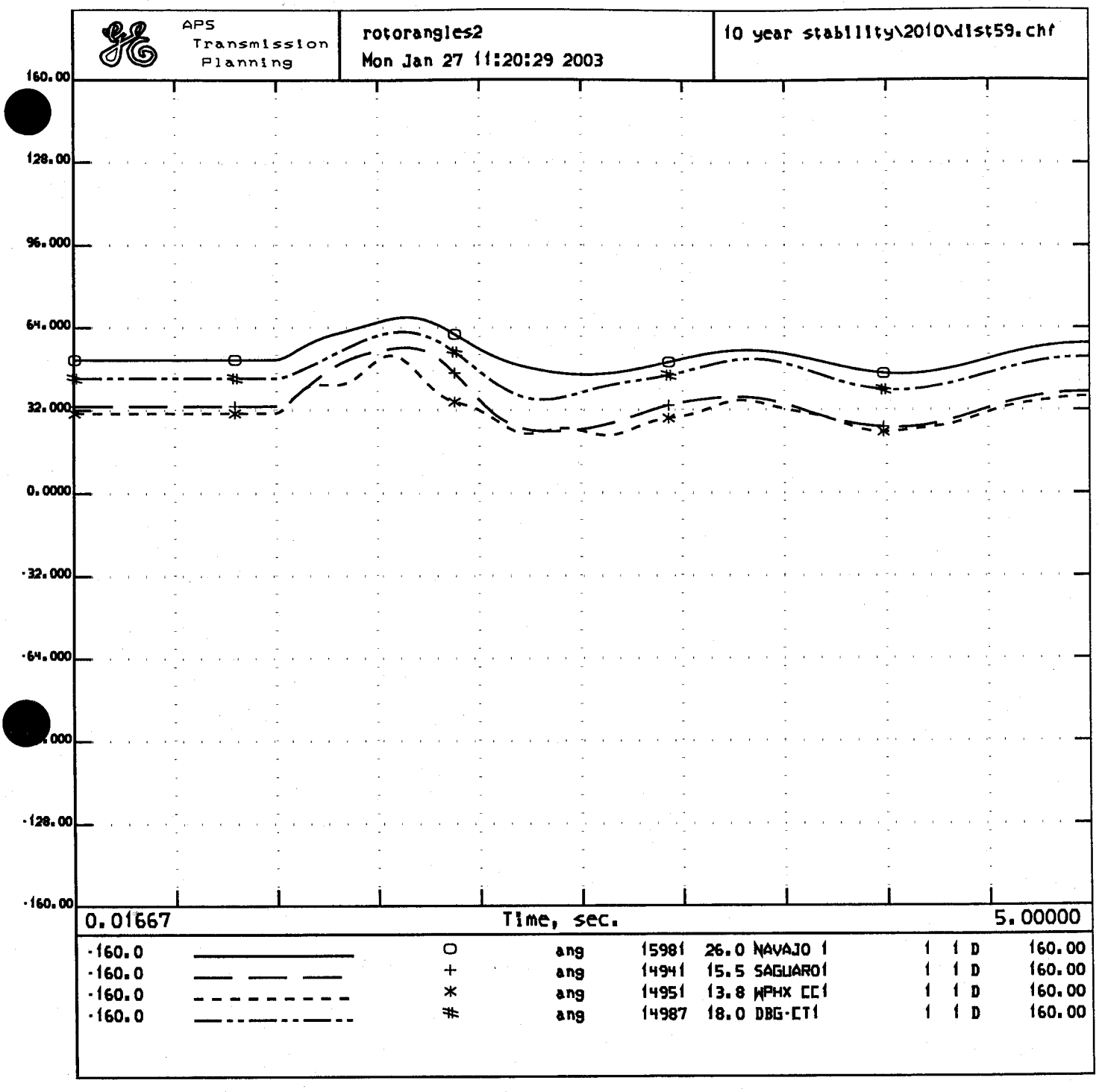
JOJOBA FLT JOJOBA-RUDD LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
JJ-RUDD STAB ;1; 01/03; T=0 3P FLT JJ500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/JJ-RUDD;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



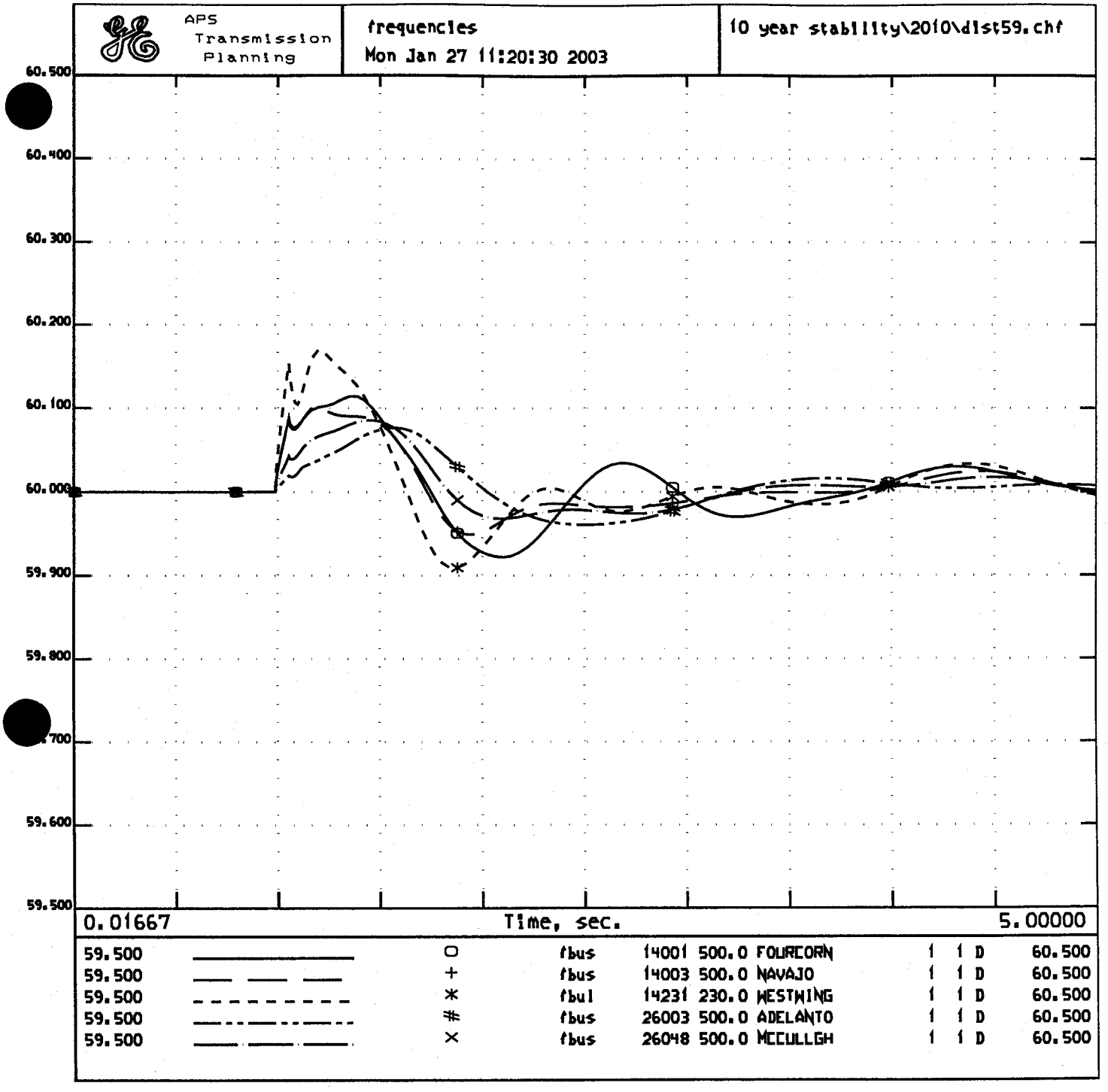
JOJOBA FLT JOJOBA-RUDD LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
JJ-RUDD STAB #1; 01/03; T=0 3P FLT JJ500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/JJ-RUDD;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



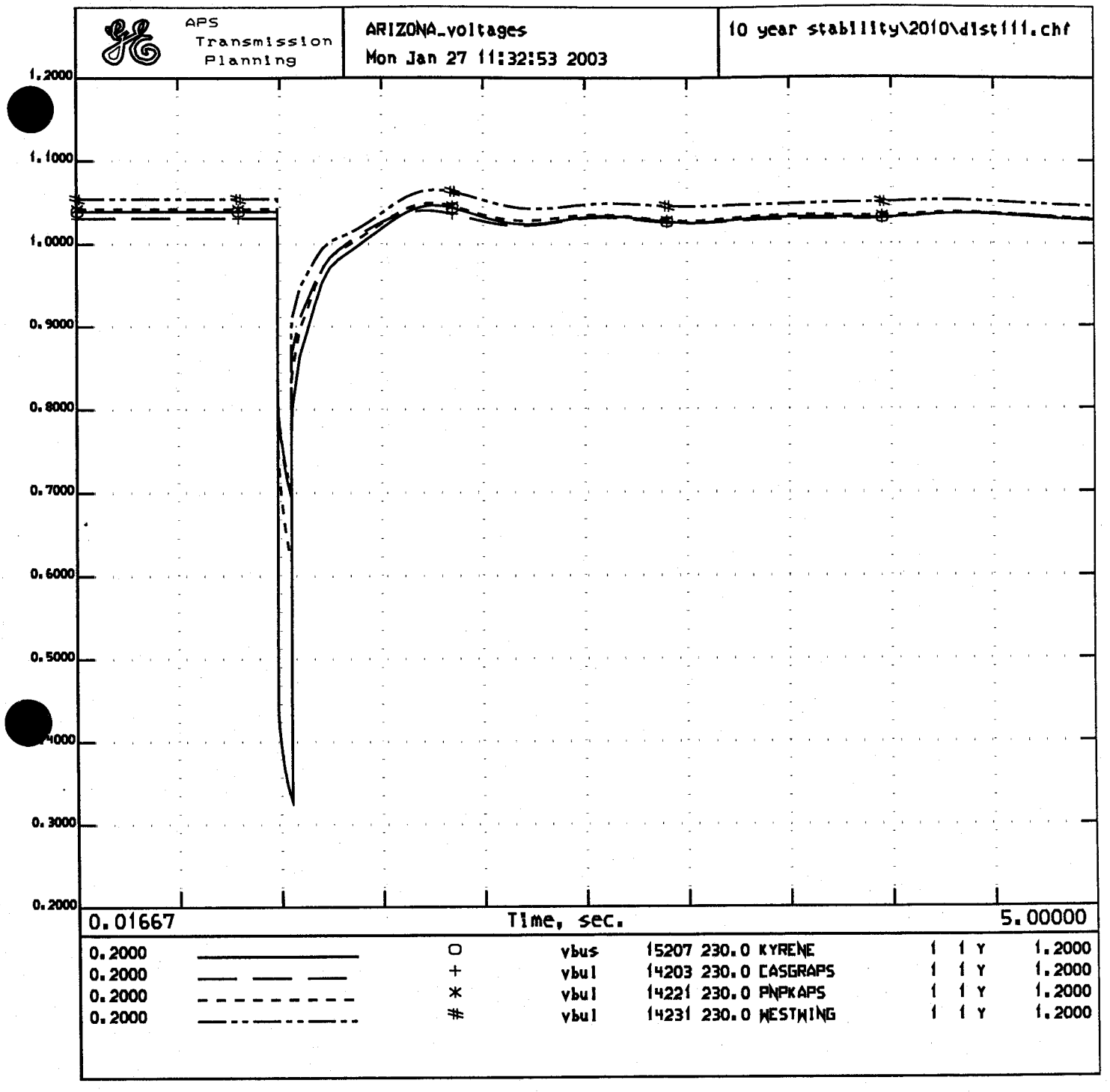
JOJOBA FLT JOJOBA-RUDD LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
JJ-RUDD STAB #1; 01/03; T=0 3P FLT JJ500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/JJ-RUDD;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



JOJOBA FLT JOJOBA-RUDD LINE OUT
Originally the 2007 HSIA APPROVED BASE CASE
NOVEMBER 13, 2002
JJ-RUDD STAB #1; 01/03; T=0 3P FLT JJ500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/JJ-RUDD;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



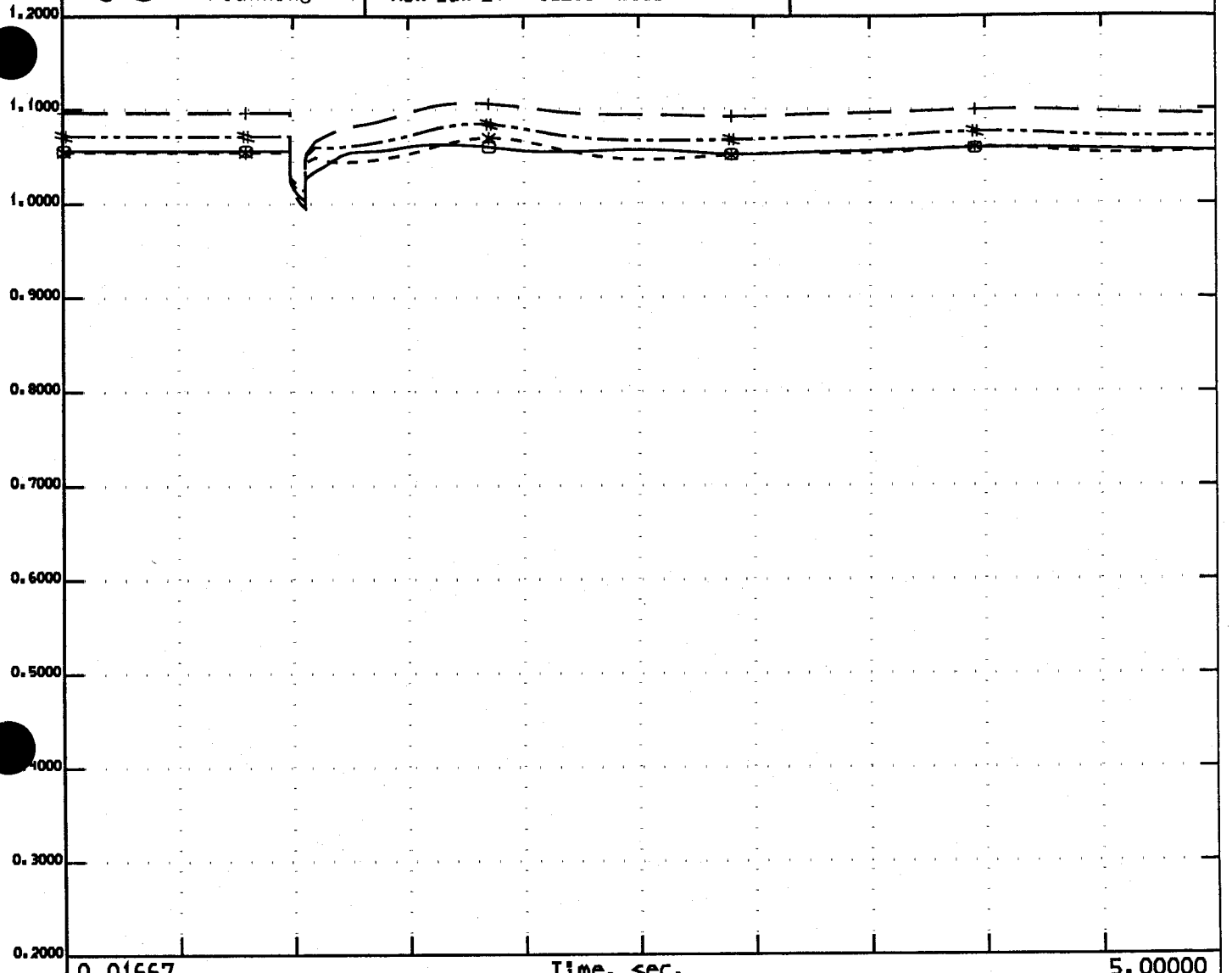
KYRENE FLT RUDD-KYR LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
RUDD-KYR STAB :1; 01/03; T=0 3P FLT KYR500;
4C CLR FLT W/RUDD-KYR;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.

APS Transmission Planning

EHV_voltages
Mon Jan 27 11:32:54 2003

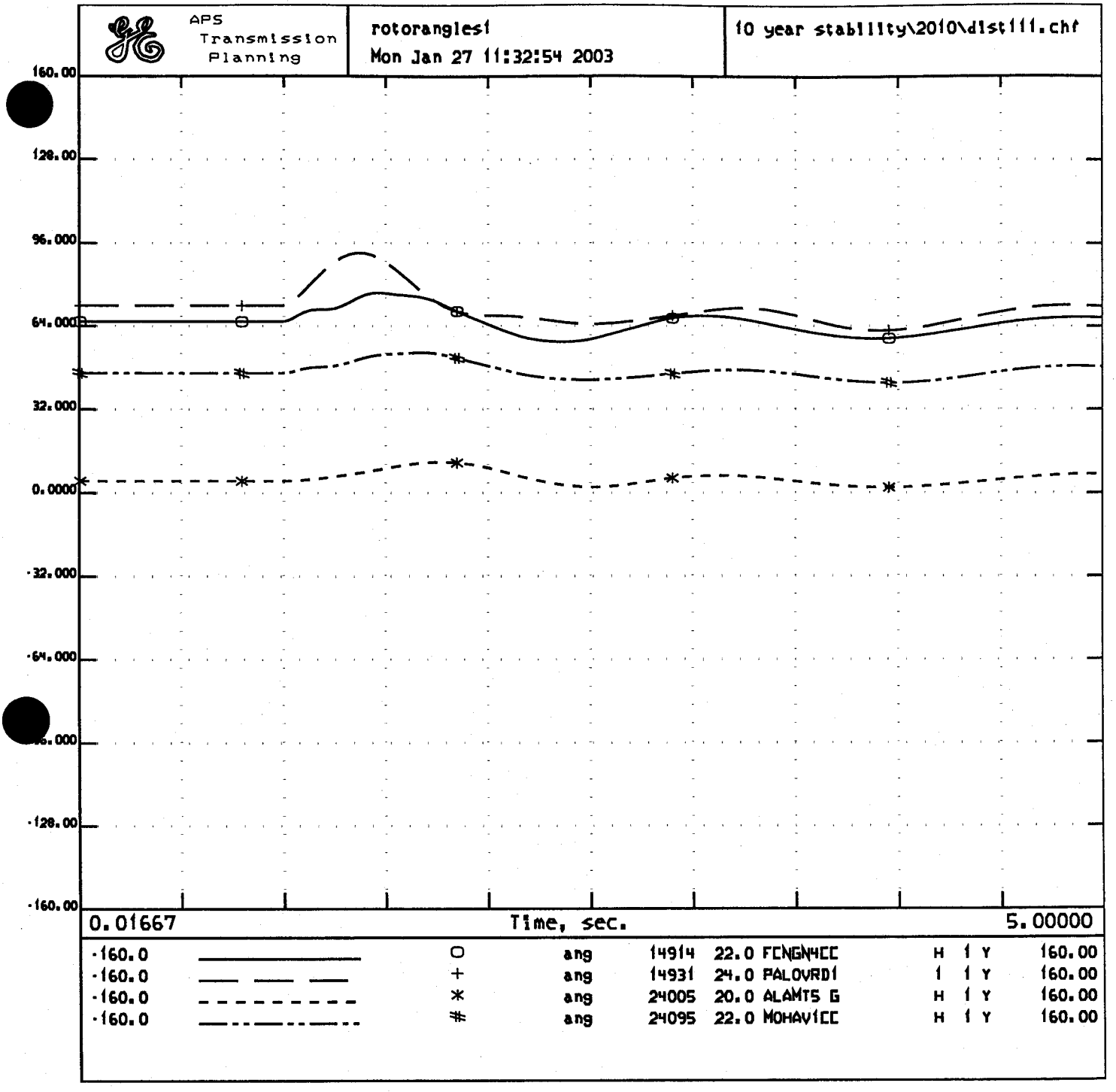
10 year stability\2010\dlstlll.chf



0.2000	————	O	vbus	14001	500.0	FOURCORN	1	1 Y	1.2000
0.2000	— — —	+	vbus	14003	500.0	NAVAJO	1	1 Y	1.2000
0.2000	- - - - - -	*	vbus	26003	500.0	ADELANTO	1	1 Y	1.2000
0.2000	—-—-—	#	vbus	26048	500.0	MCCULLGH	1	1 Y	1.2000

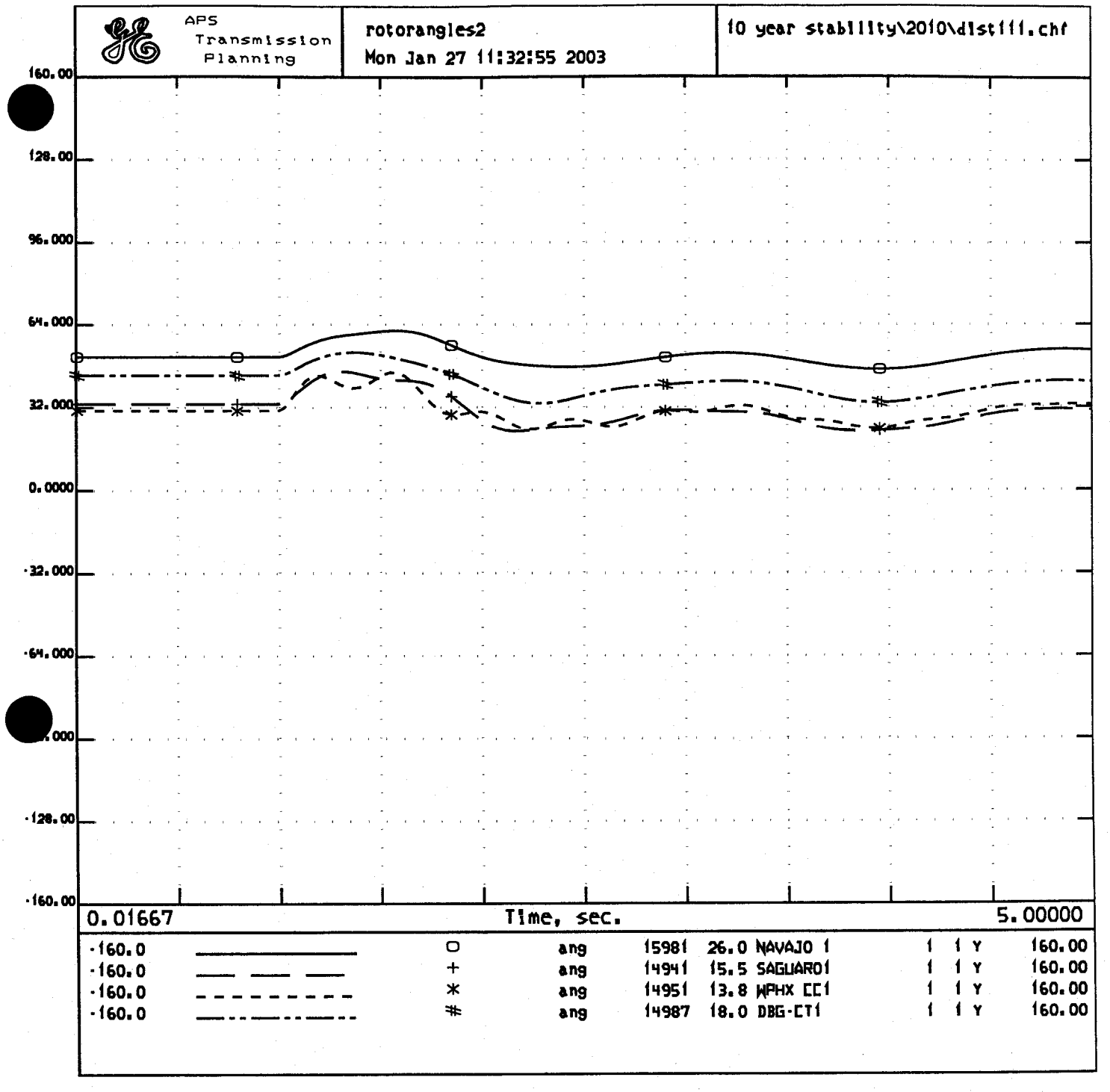
KYRENE FLT RUDD-KYR LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
RUDD-KYR STAB ;1; 01/03; T=0 3P FLT KYR500;
4C CLR FLT W/RUDD-KYR;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



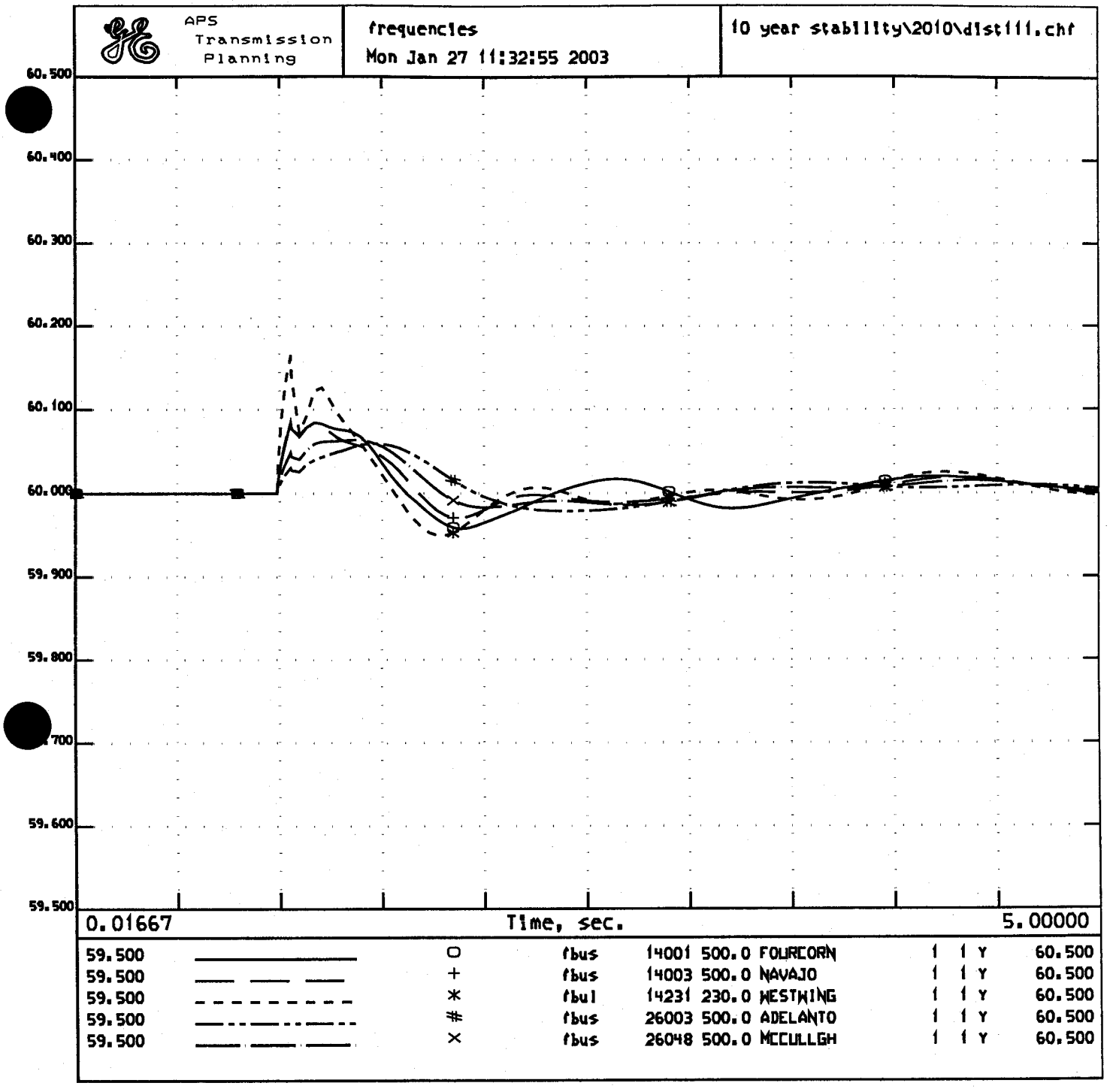
KYRENE FLT RUDD-KYR LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
RUDD-KYR STAB s1; 01/03; T=0 3P FLT KYR500;
4C CLR FLT W/RUDD-KYR;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



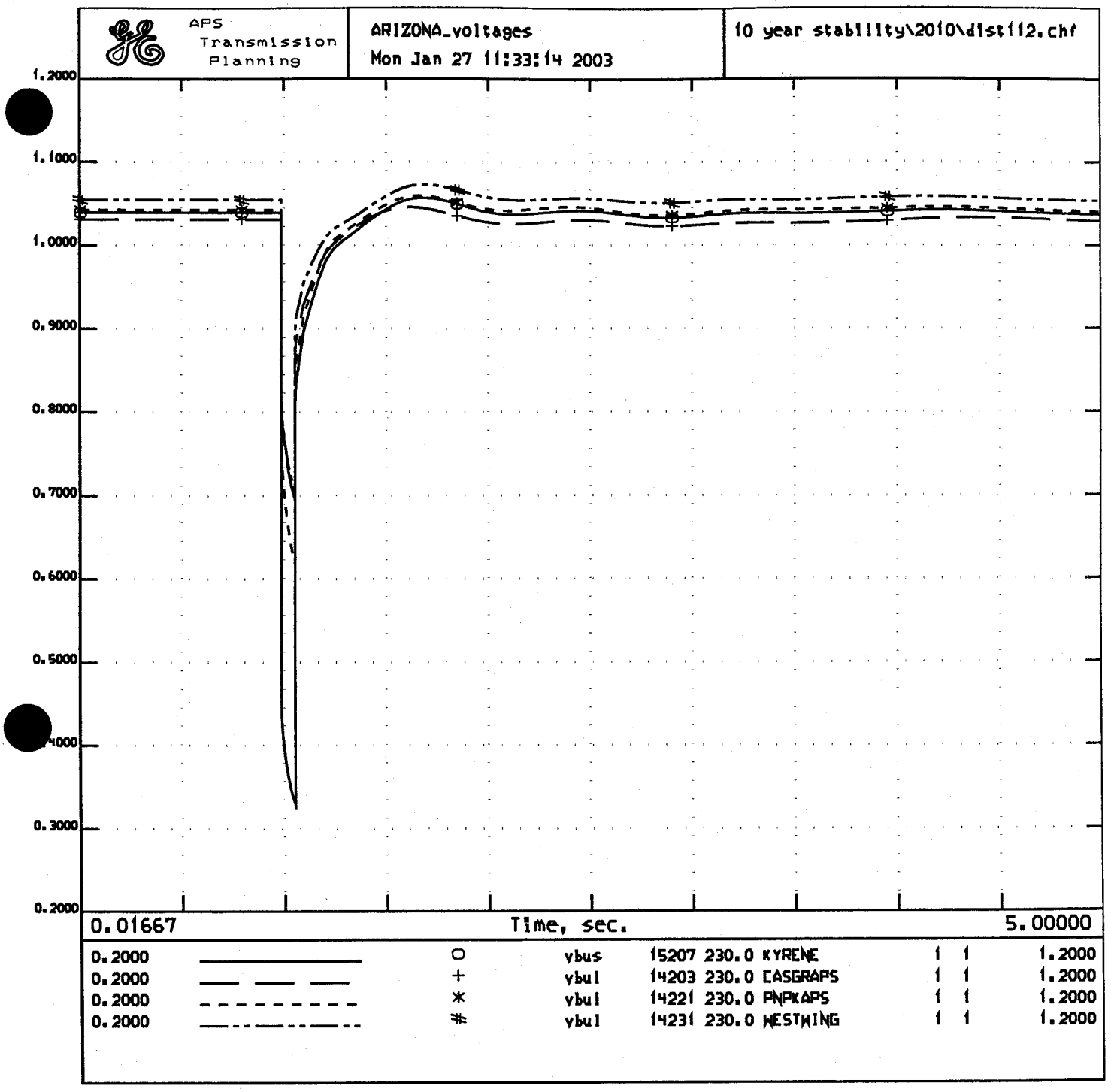
KYRENE FLT RUDD-KYR LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
RUDD-KYR STAB #1; 01/03; T=0 3P FLT KYR500;
4C CLR FLT W/RUDD-KYR;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



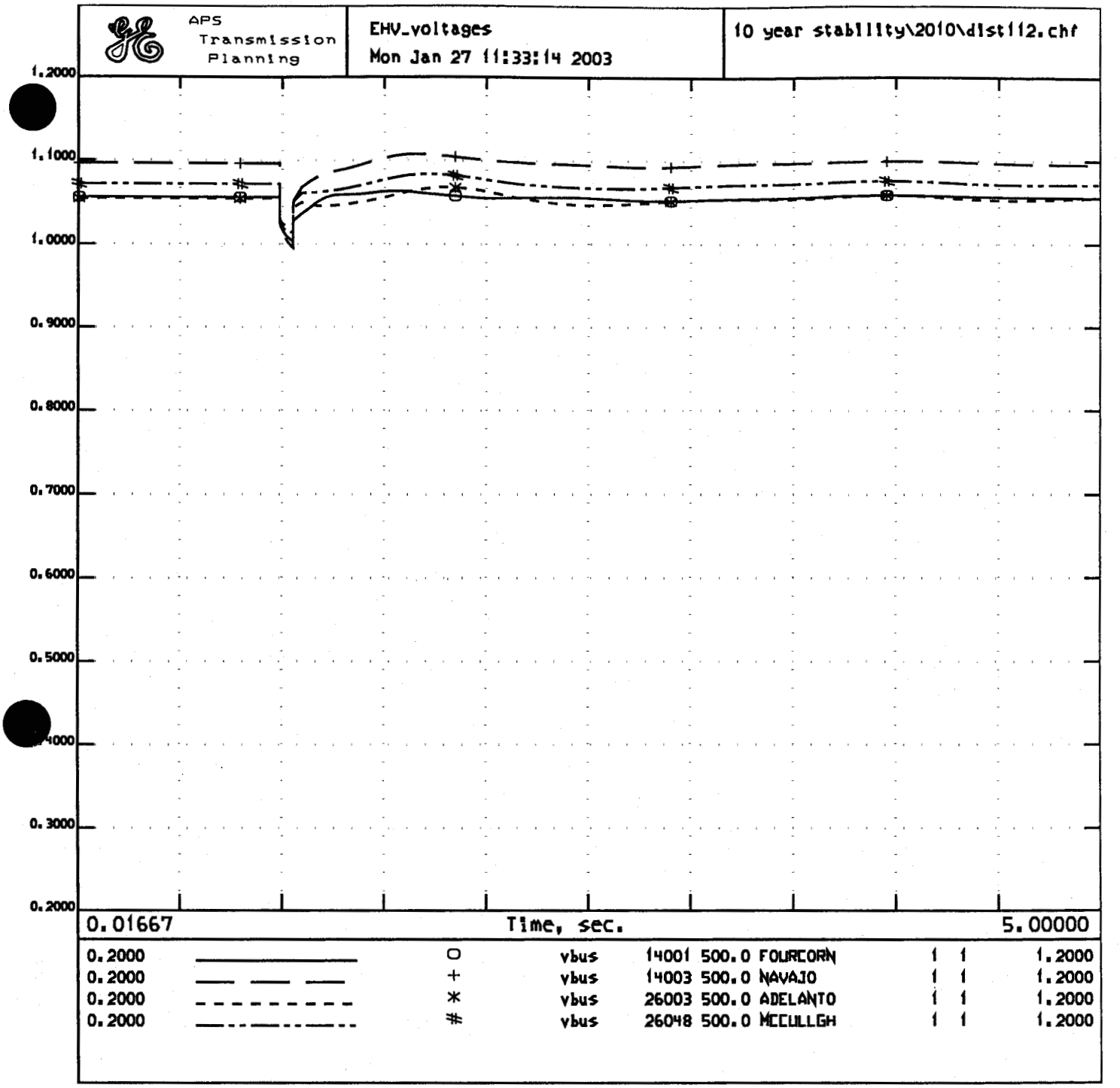
KYRENE FLT RUDD-KYR LINE OUT
Originally the 2007 HSIA APPROVED BASE CASE
NOVEMBER 13, 2002
RUDD-KYR STAB :1; 01/03; T=0 3P FLT KYR500;
4C CLR FLT W/RUDD-KYR;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



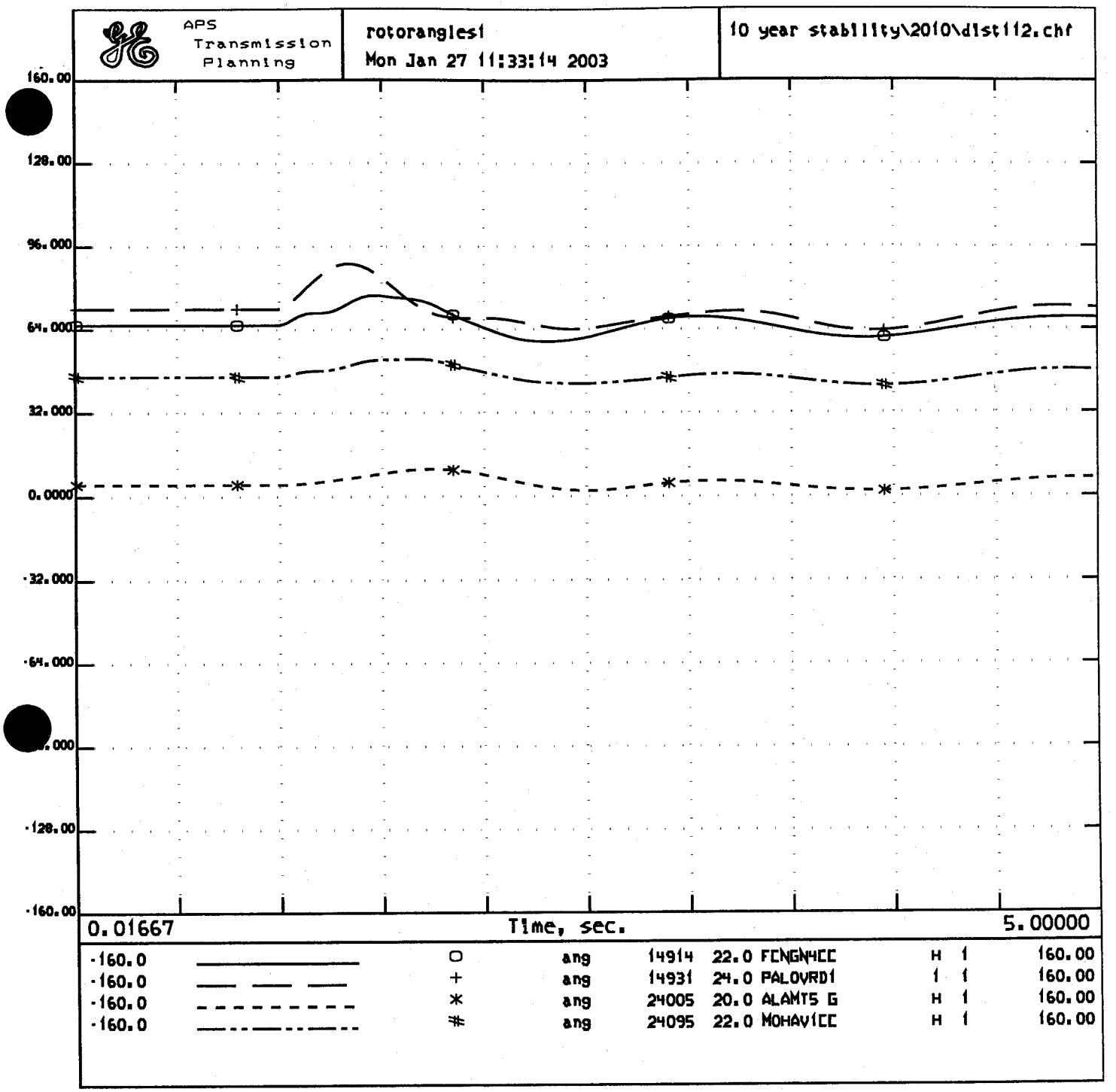
KYRENE FLT BRWN-KYR LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
BRWN-KYR STAB ;1; 01/03; T=0 3P FLT KYR500;
4C CLR FLT W/BRWN-KYR;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



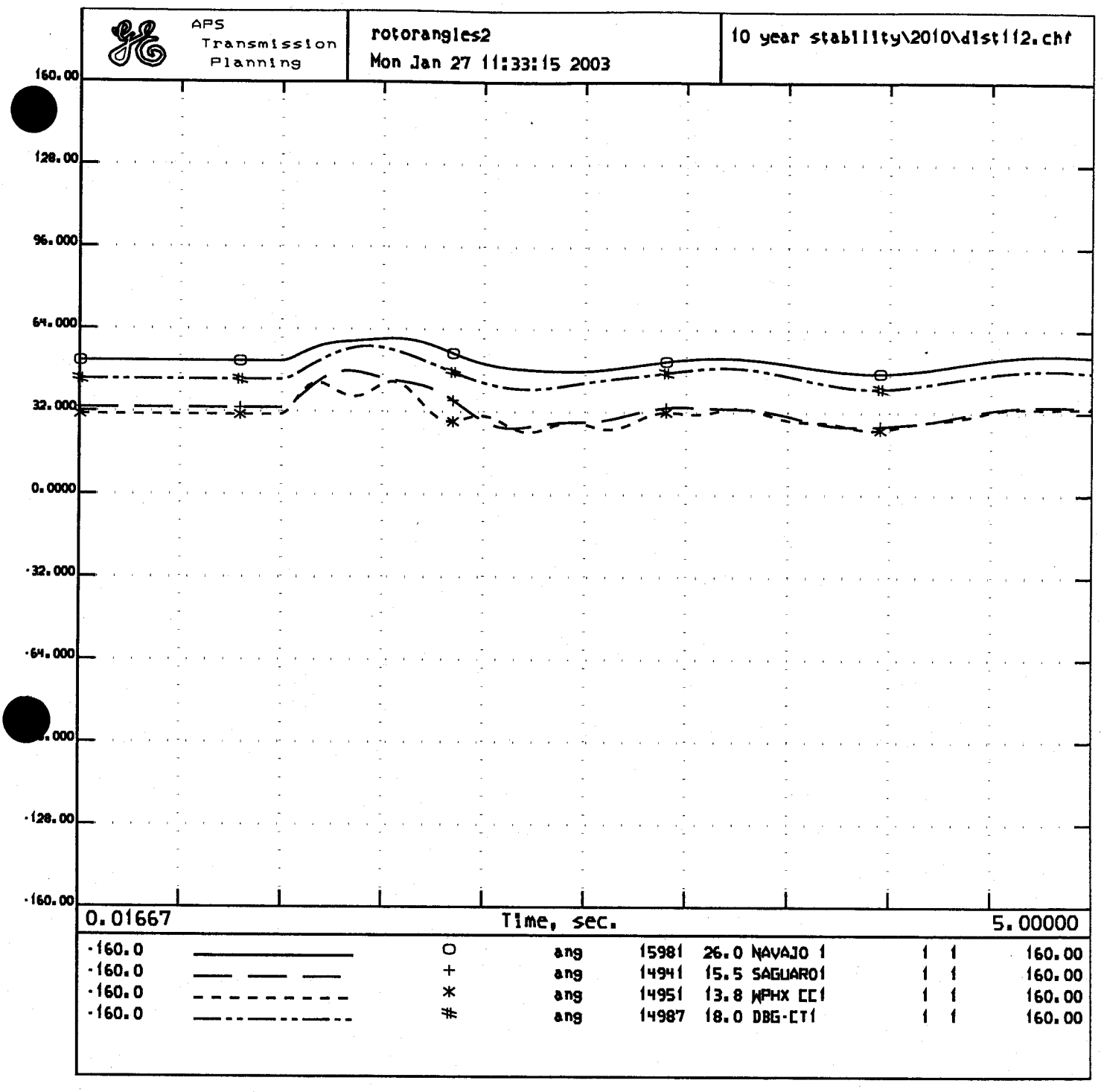
KYRENE FLT BRWN-KYR LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
BRWN-KYR STAB #1; 01/03; T=0 3P FLT KYR500;
4C CLR FLT W/BRWN-KYR;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



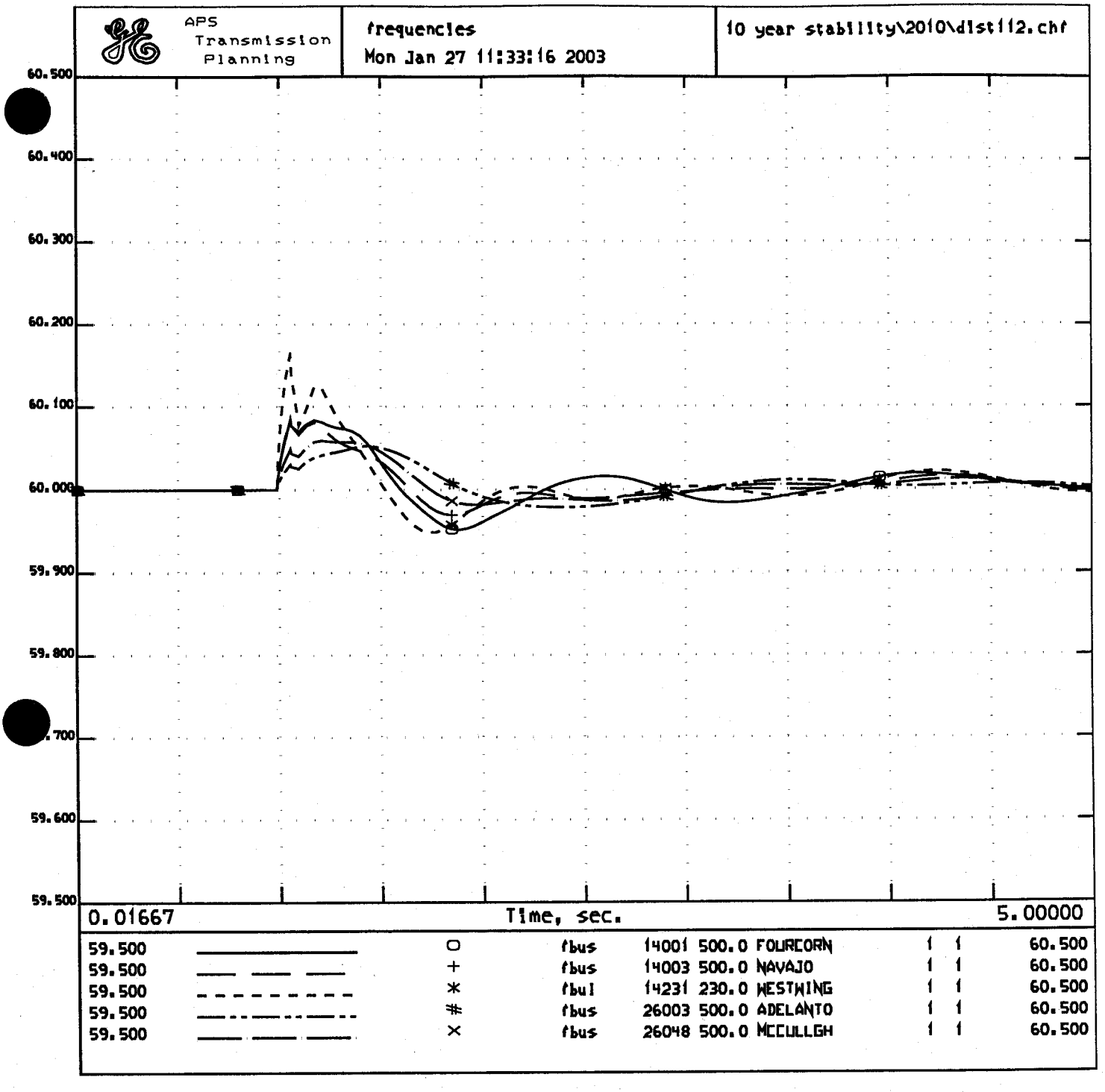
KYRENE FLT BRWN-KYR LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
BRWN-KYR STAB =1; 01/03; T=0 3P FLT KYR500;
4C CLR FLT W/BRWN-KYR;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



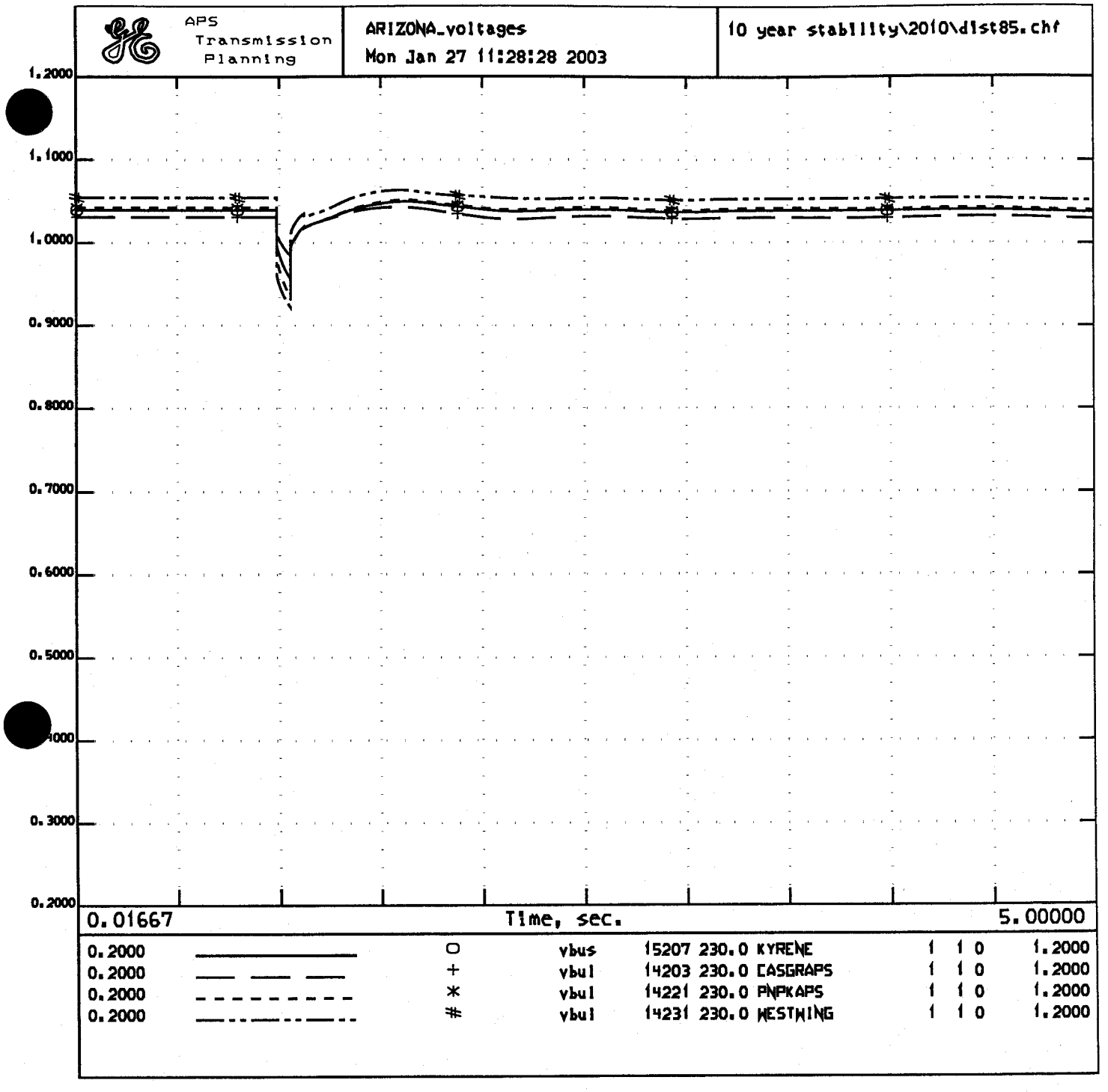
KYRENE FLT BRWN-KYR LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
BRWN-KYR STAB #1; 01/03; T=0 3P FLT KYR500;
4C CLR FLT W/BRWN-KYR;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



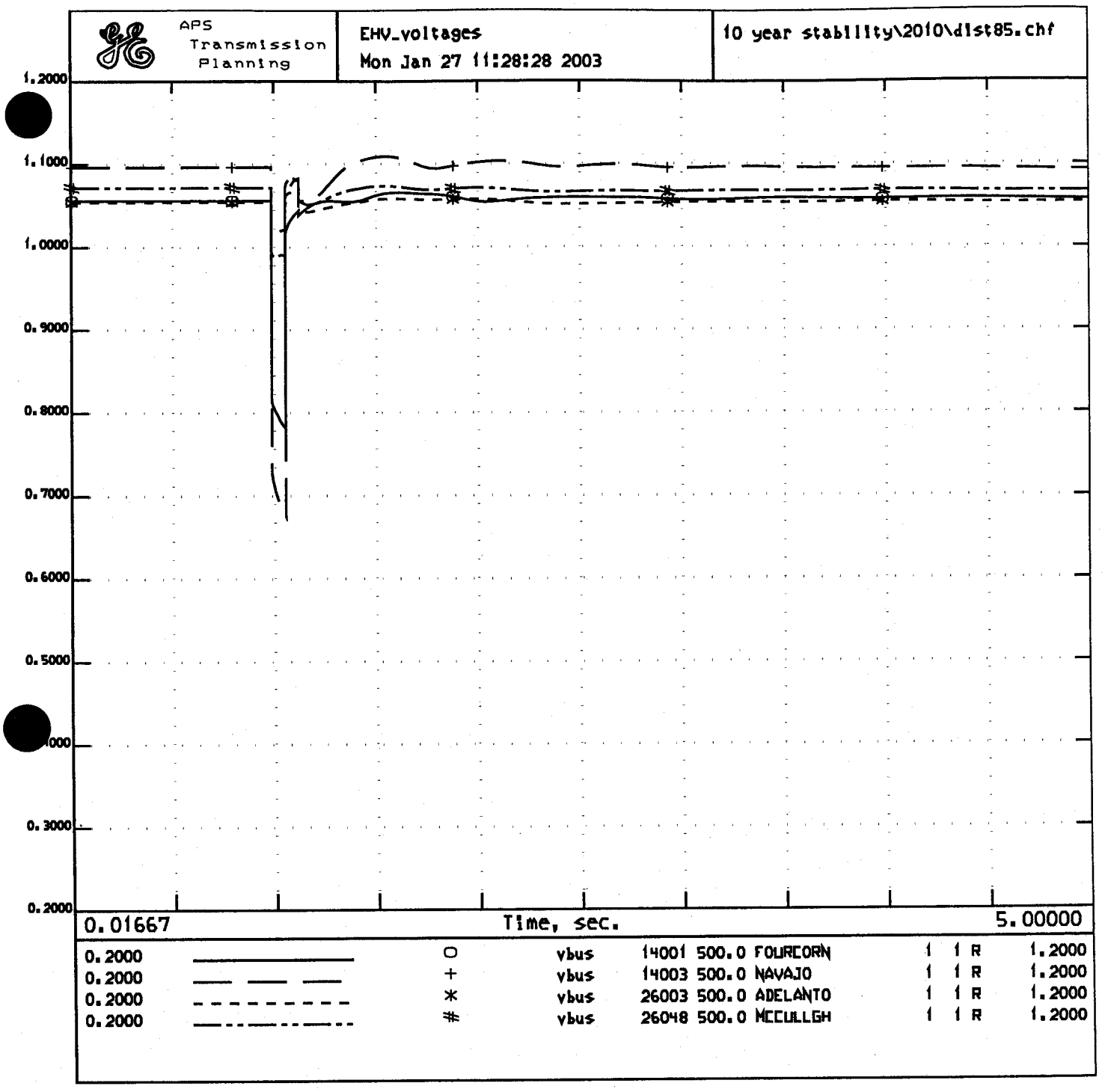
KYRENE FLT BRWN-KYR LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
BRWN-KYR STAB .1; 01/03; T=0 3P FLT KYR500;
4C CLR FLT W/BRWN-KYR;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



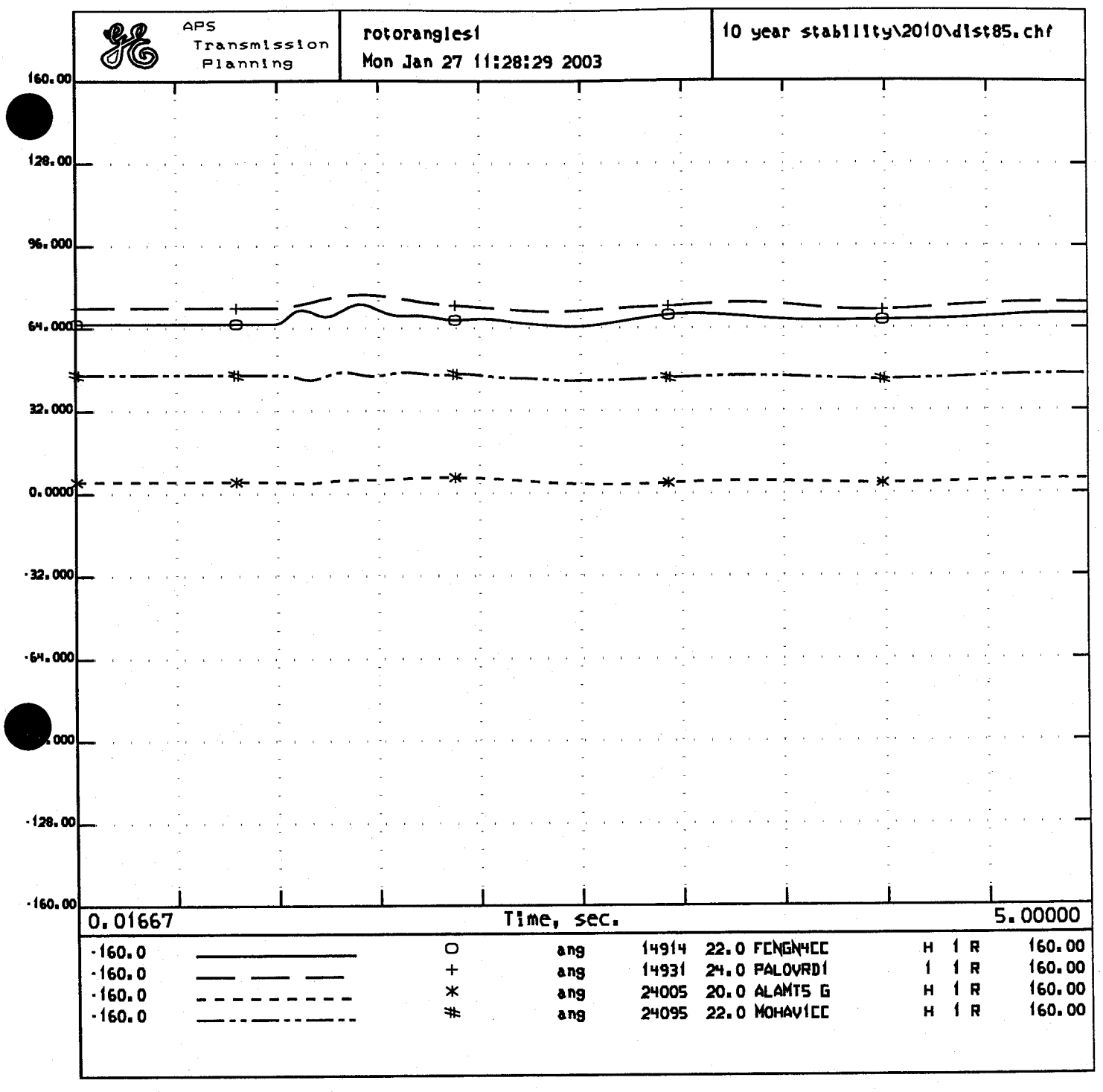
2010 Base Case for ACC 10-YR Stability Runs
MKP FLT. MKP-ELD line out
NOVEMBER 13, 2002
MKP-ELD STAB; 1/03; T=0 3P FLT MKP500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/MKP-ELD;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



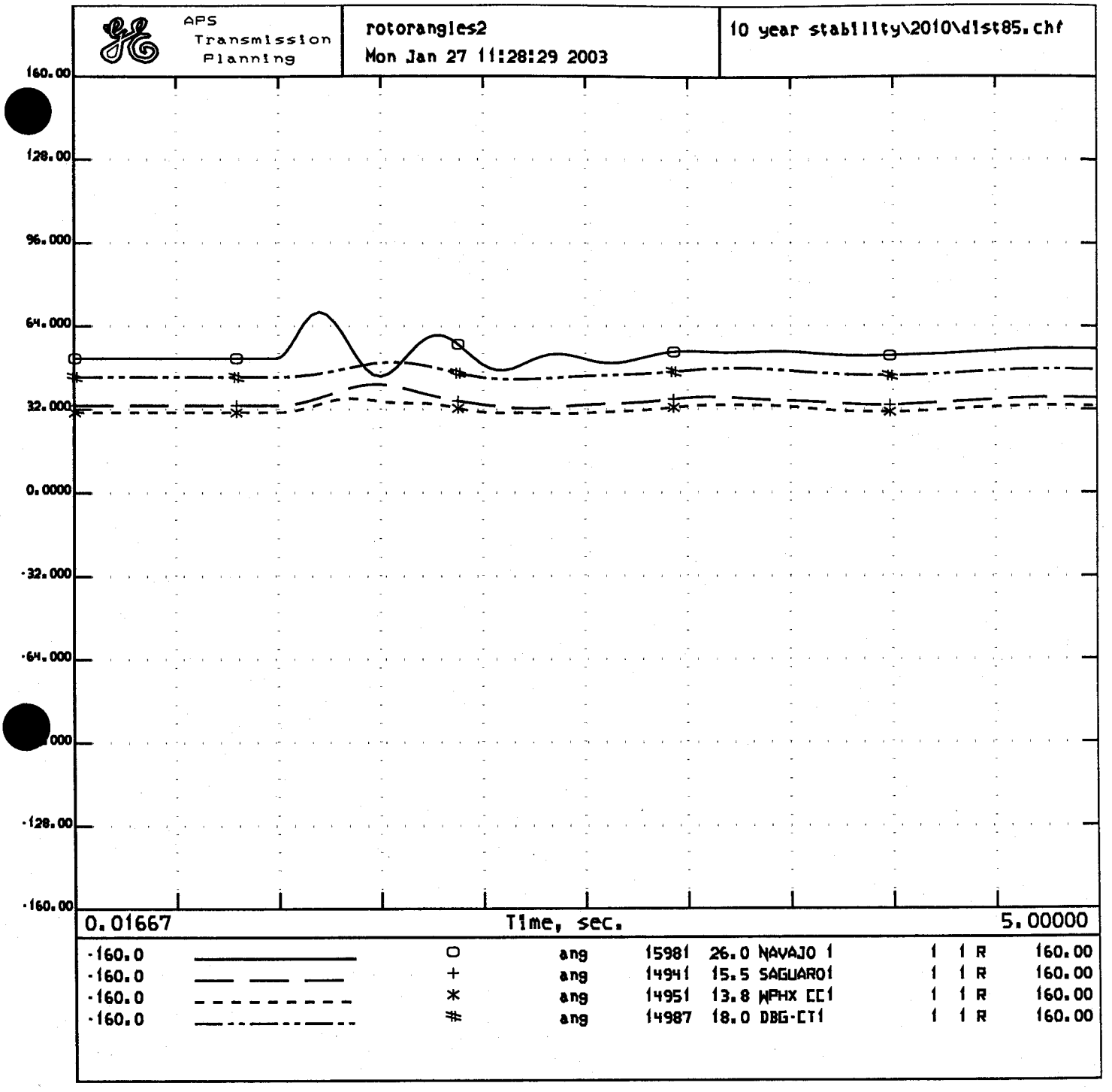
2010 Base Case for ACC 10-YR Stability Runs
MKP FLT. MKP-ELD line out
NOVEMBER 13, 2002
MKP-ELD STAB; 1/03; T=0 3P FLT MKP500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/MKP-ELD;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



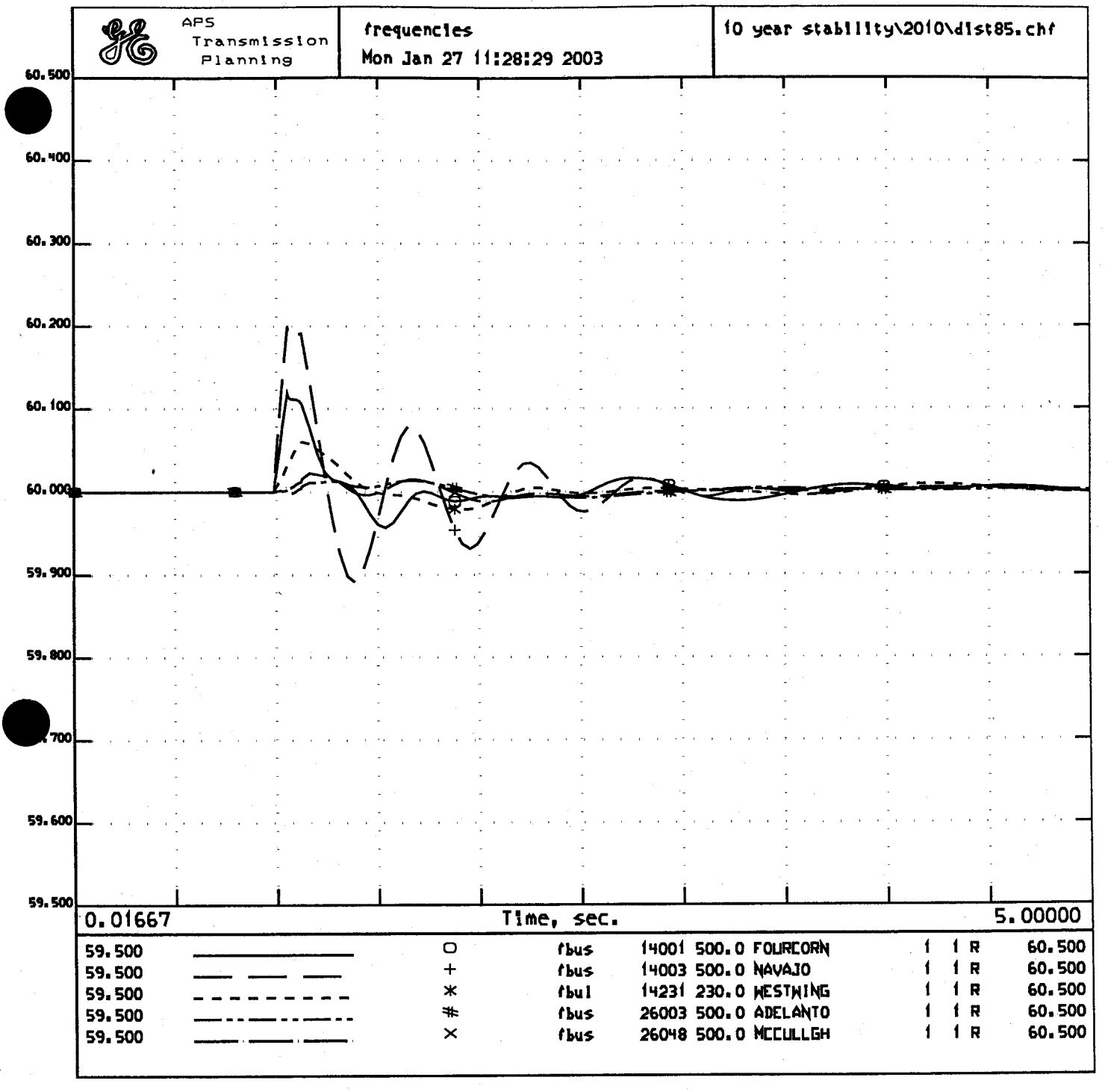
2010 Base Case for ACC 10-YR Stability Runs
MKP FLT. MKP-ELD line out
NOVEMBER 13, 2002
MKP-ELD STAB; 1/03; T=0 3P FLT MKP500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/MKP-ELD;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



2010 Base Case for ACC 10-YR Stability Runs
MKP FLT. MKP-ELD line out
NOVEMBER 13, 2002
MKP-ELD STAB; 1/03; T=0 3P FLT MKP500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/MKP-ELD;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



2010 Base Case for ACC 10-YR Stability Runs
MKP FLT. MKP-ELD line out
NOVEMBER 13, 2002
MKP-ELD STAB; 1/03; T=0 3P FLT MKP500;FLSH CAPS MKP-YAV/YAV-WWG,
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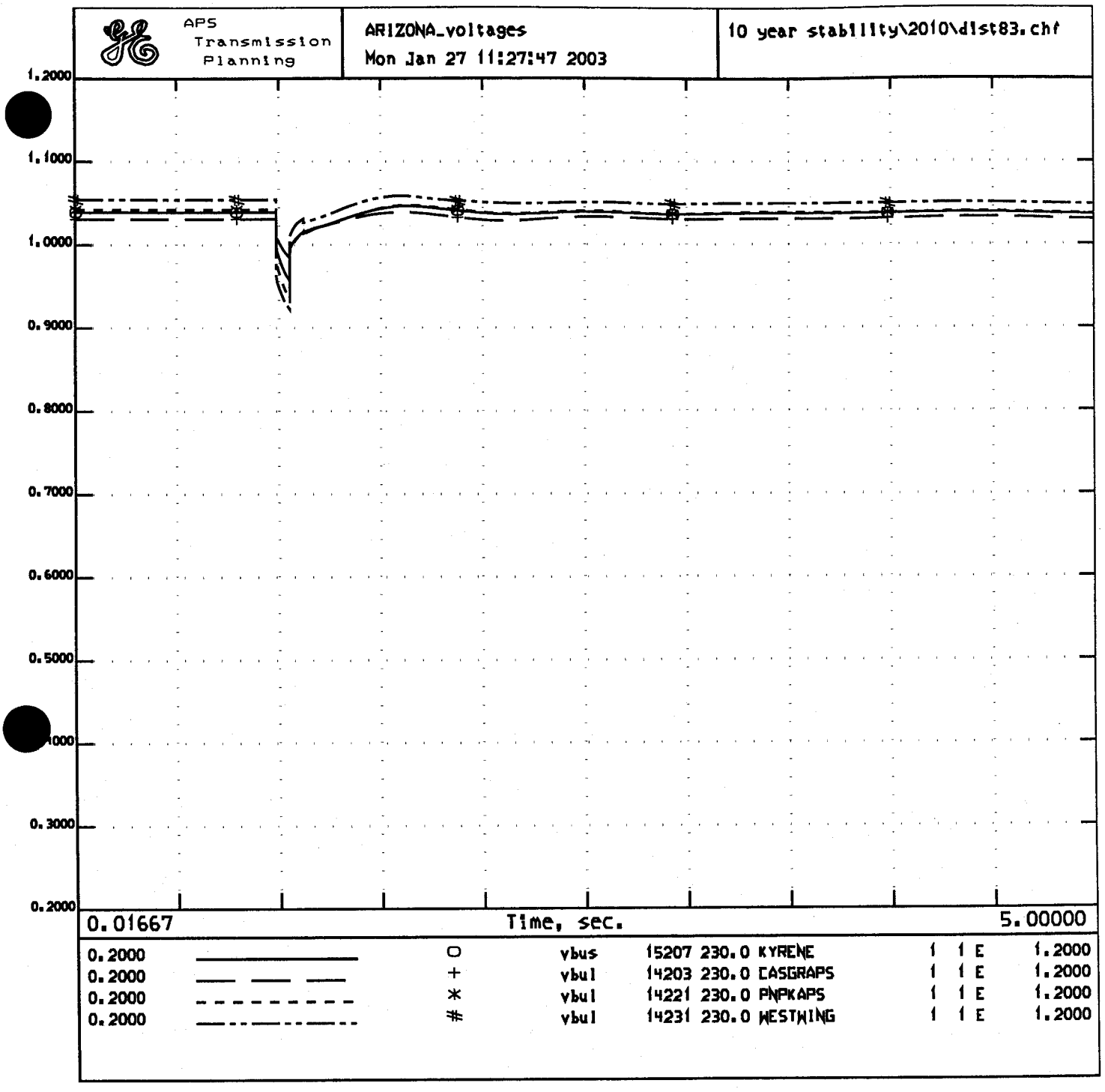
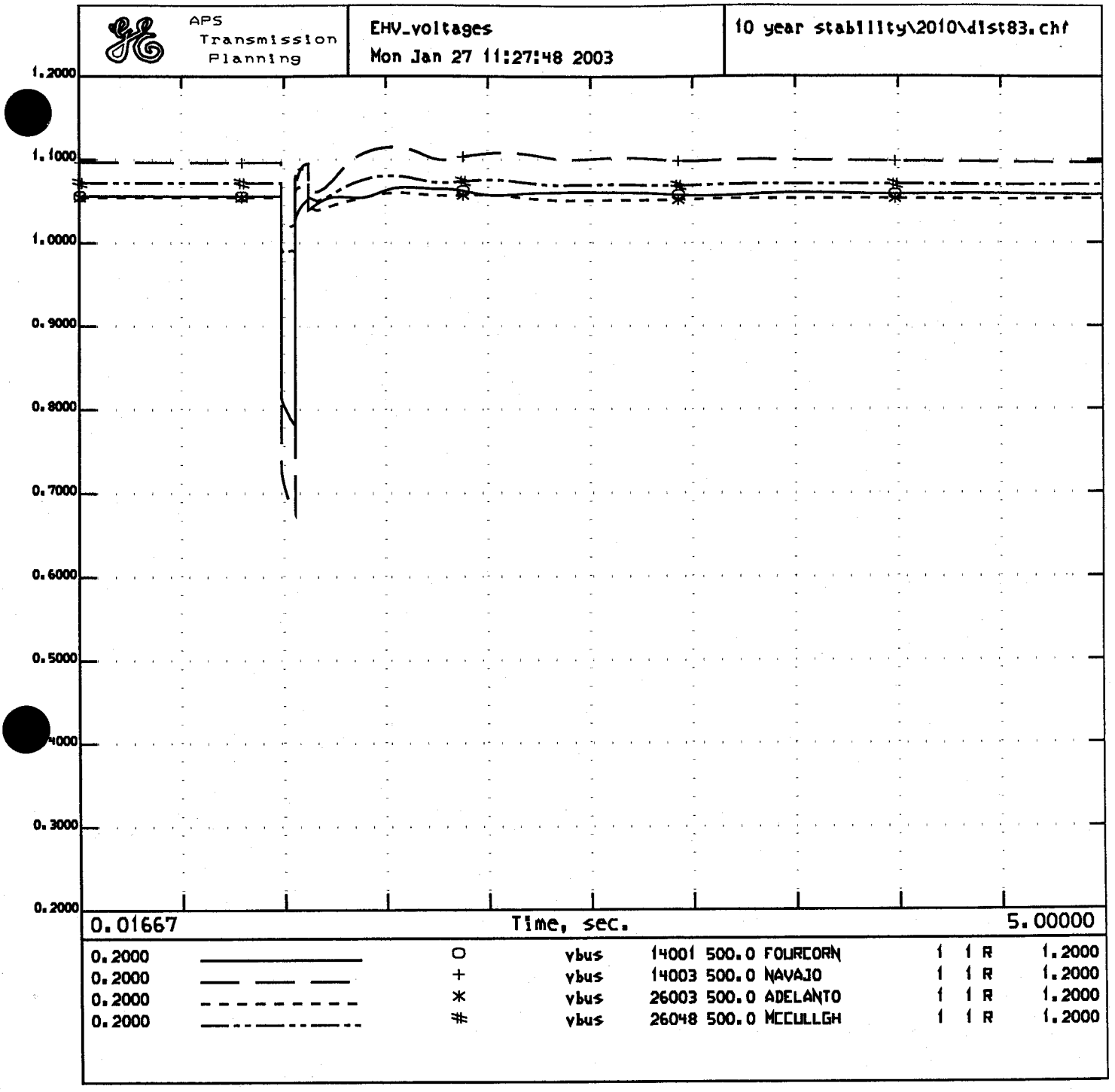
Updated the system rep. to 2010.
Updated the loads to 2010 level.



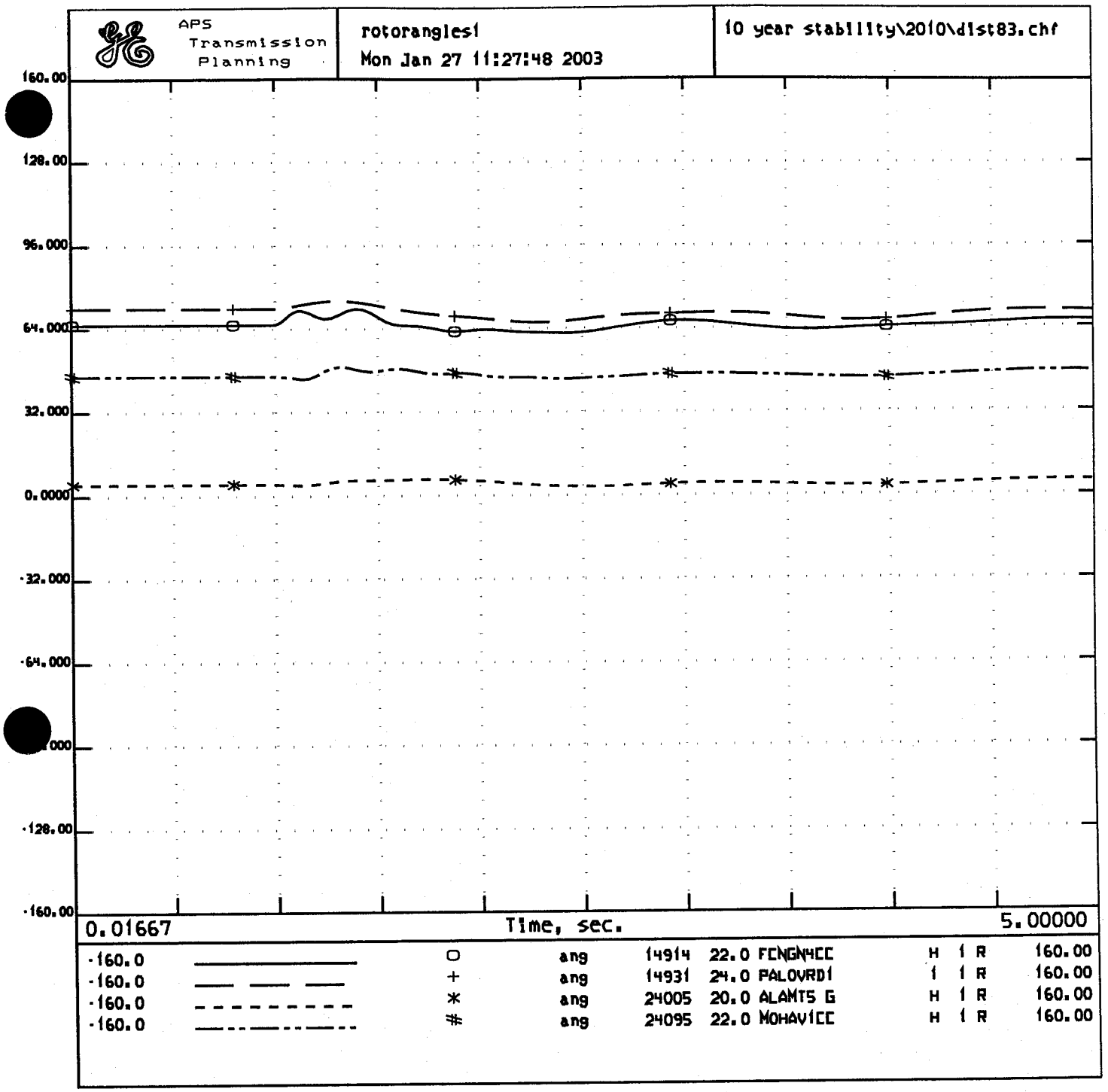
MKP. FLT MKP-YAV line out
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
MKP-YAV STAB; 1/03; T=0 3P FLT MKP500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/MKP-YAV;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



MKP. FLT MKP-YAV line out
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
MKP-YAV STAB; 1/03; T=0 3P FLT MKP500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/MKP-YAV;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



MKP. FLT MKP-YAV line out
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
MKP-YAV STAB; 1/03; T=0 3P FLT MKP500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/MKP-YAV;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
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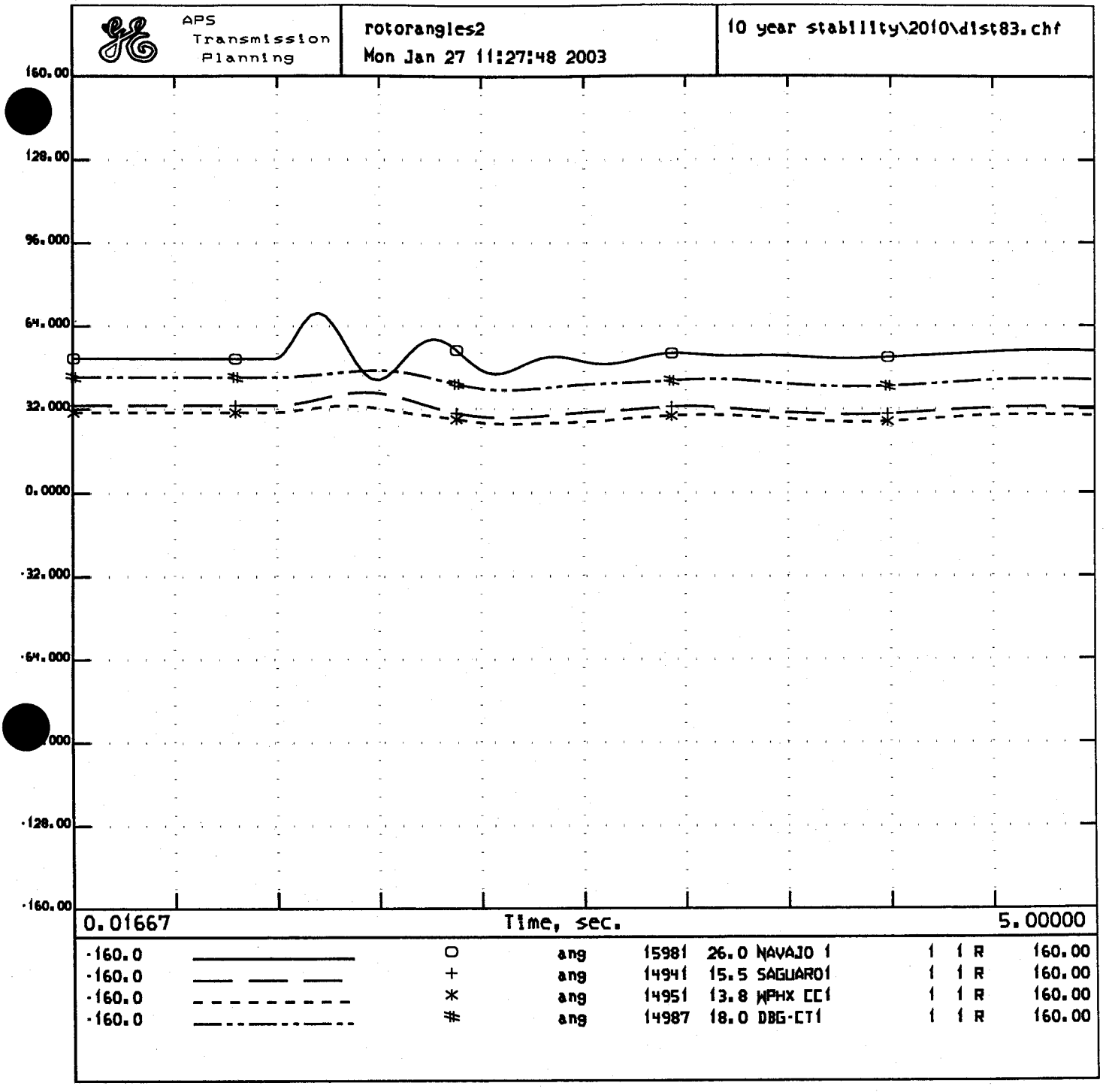
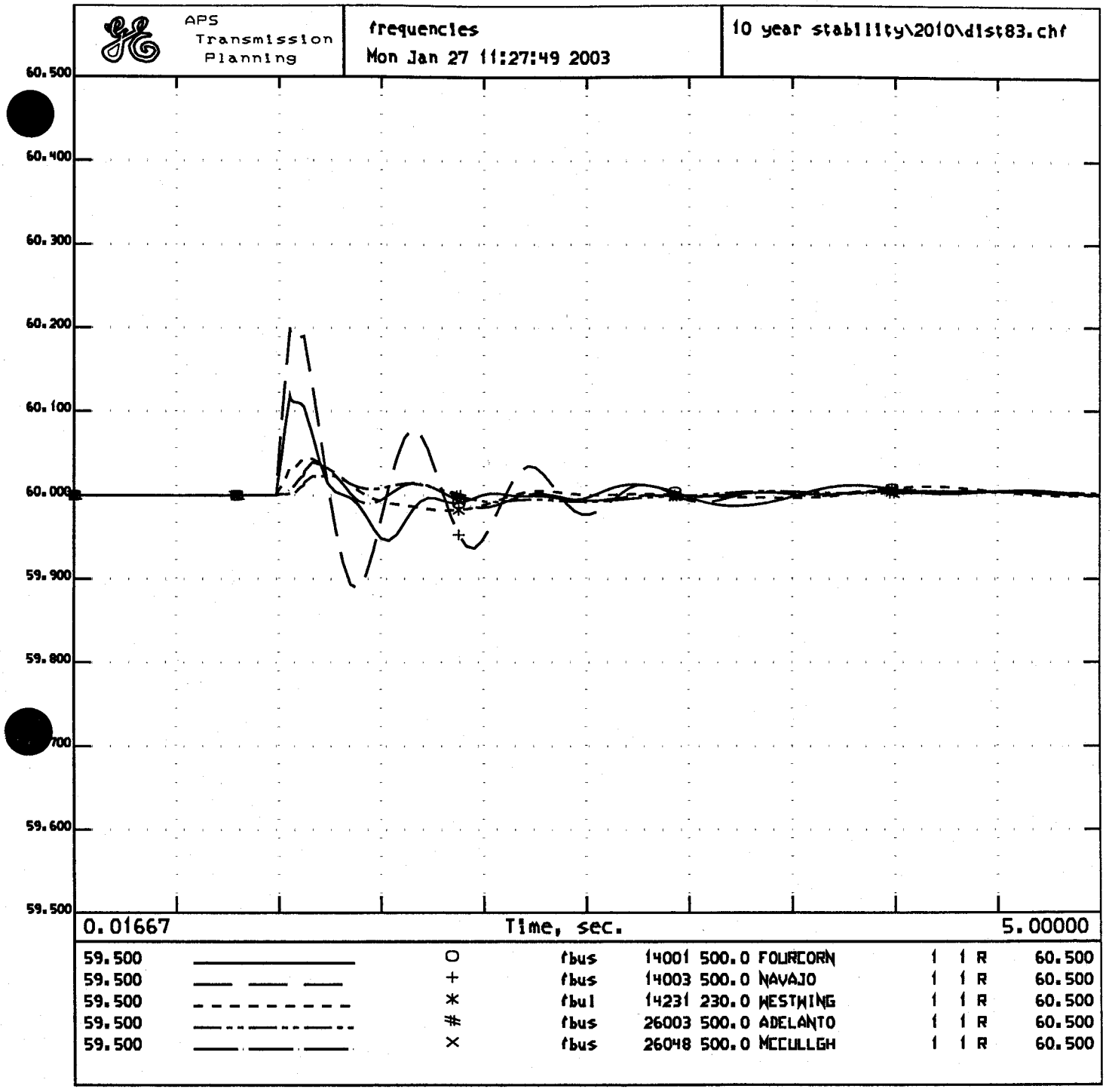


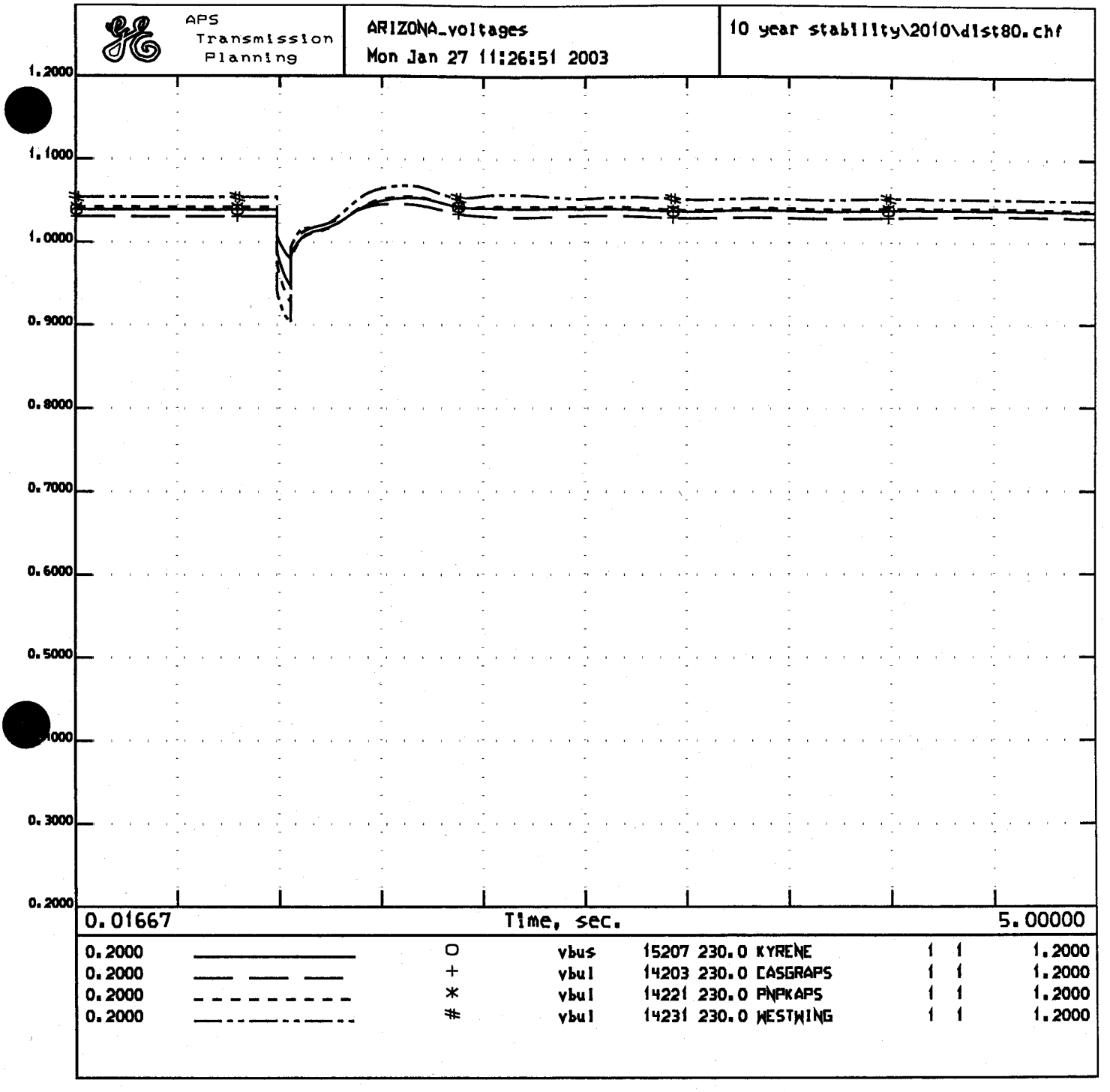
MKP. FLT MKP-YAV line out
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
MKP-YAV STAB; 1/03; T=0 3P FLT MKP500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/MKP-YAV;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



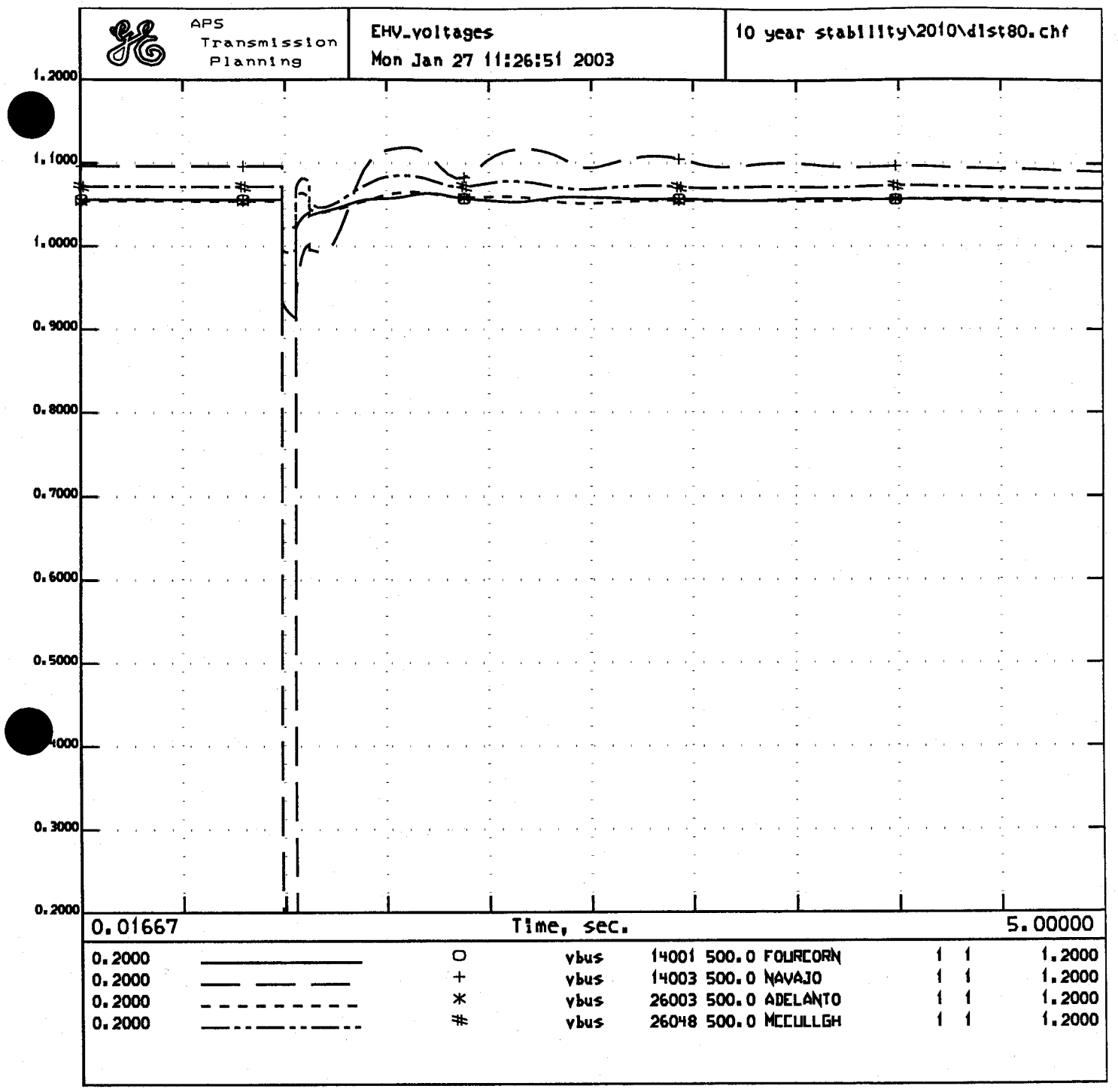
MKP. FLT MKP-YAV line out
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
MKP-YAV STAB; 1/03; T=0 3P FLT MKP500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/MKP-YAV;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



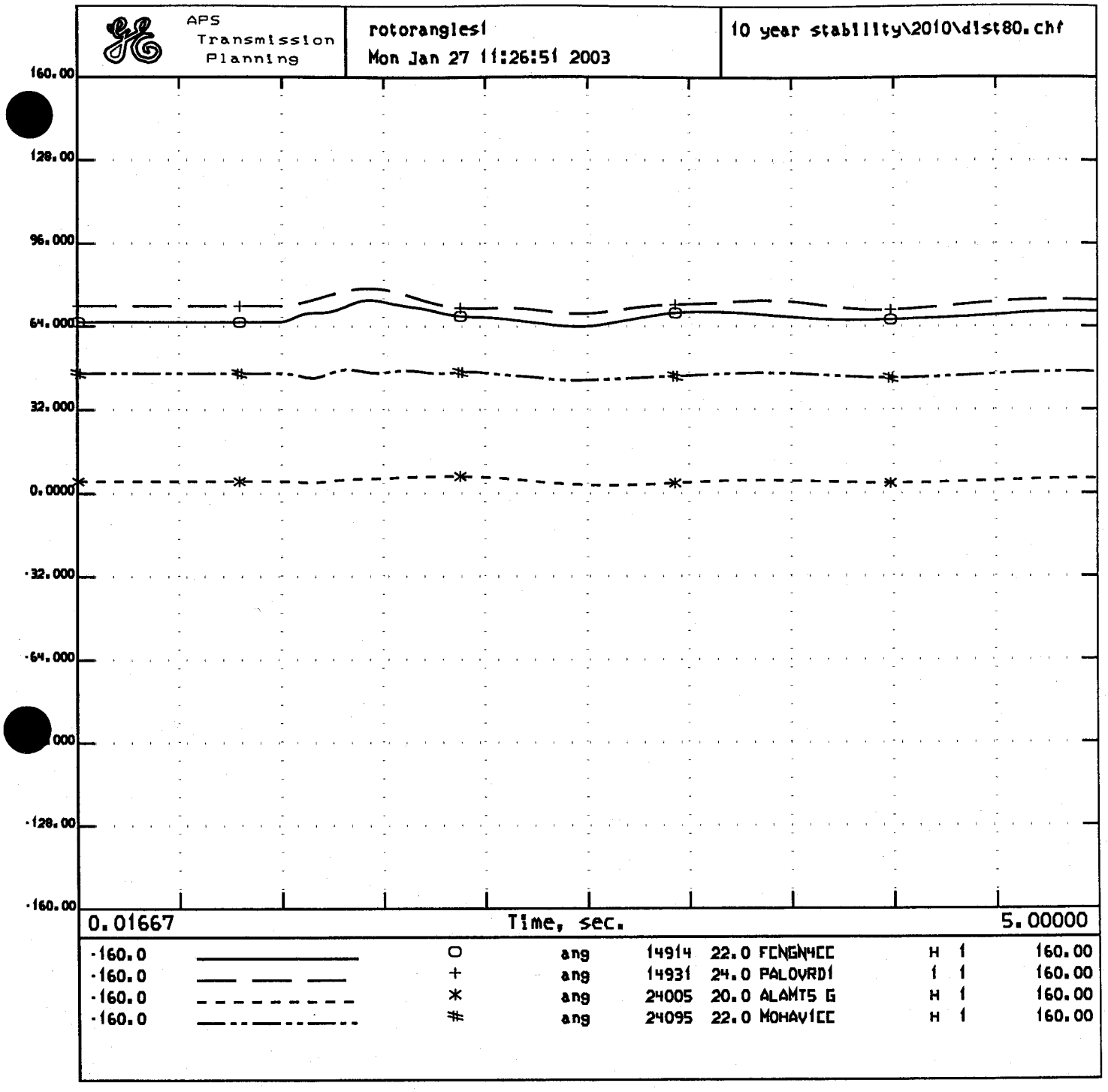
2010 Base Case for ACC 10-YR Stability Runs
NAV. FLT. Nav-Crystal line out
NOVEMBER 13, 2002
NAV-CRYS STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-CRYS;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



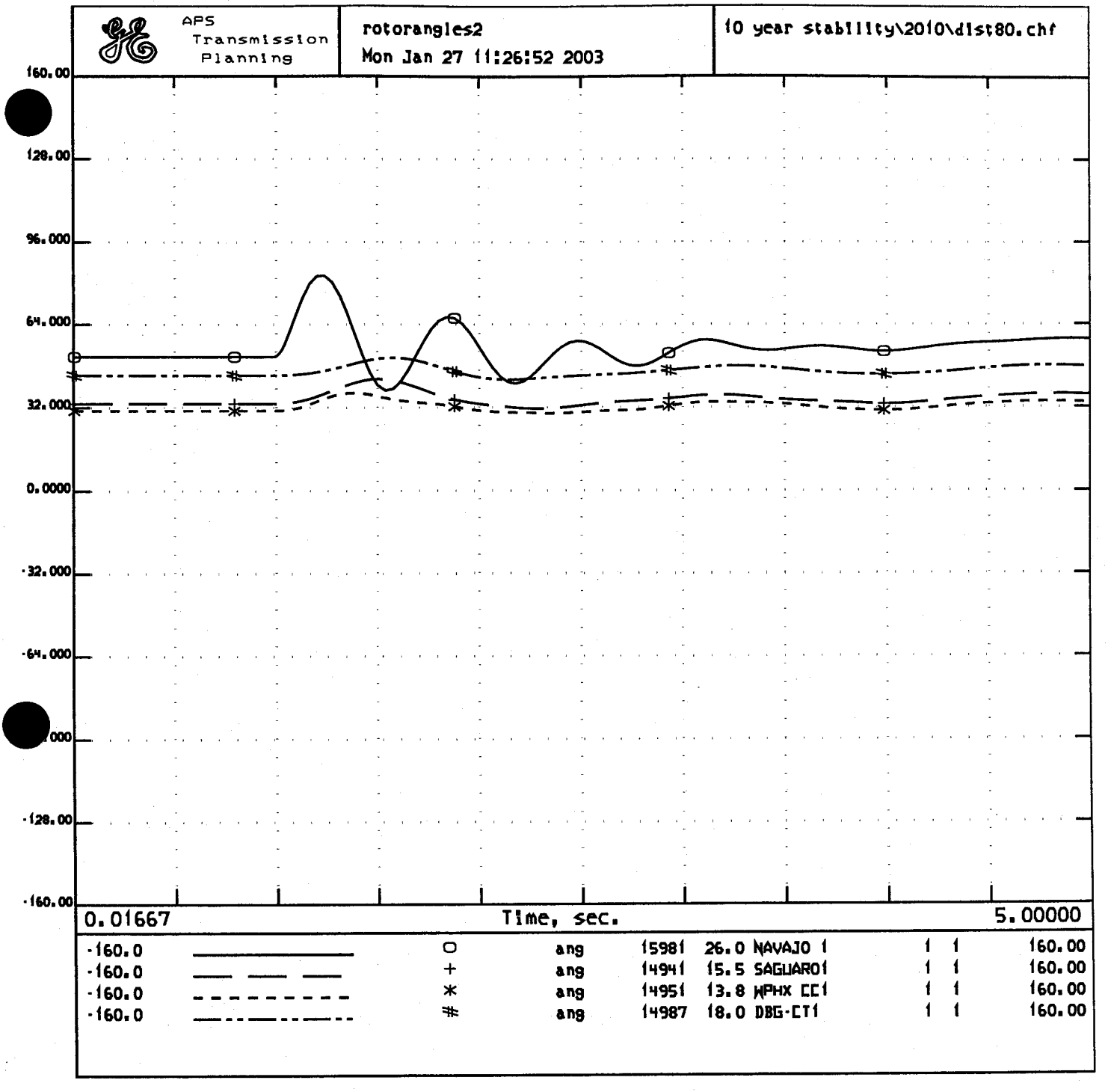
2010 Base Case for ACC 10-YR Stability Runs
NAV. FLT. Nav-Crystal line out
NOVEMBER 13, 2002
NAV-CRYS STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-CRYS;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



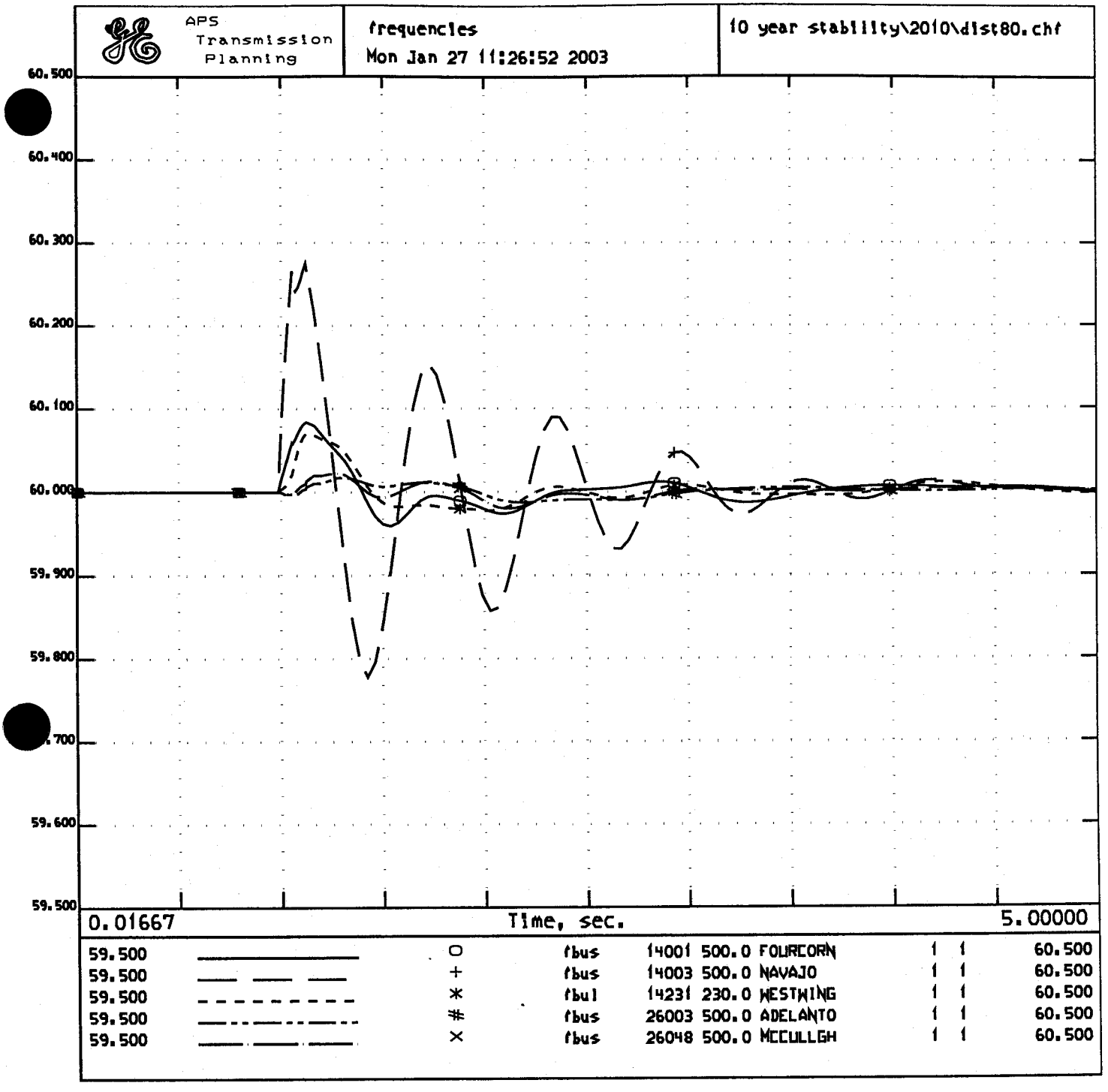
2010 Base Case for ACC 10-YR Stability Runs
NAV. FLT. Nav-Crystal line out
NOVEMBER 13, 2002
NAV-CRYS STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-CRYS;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



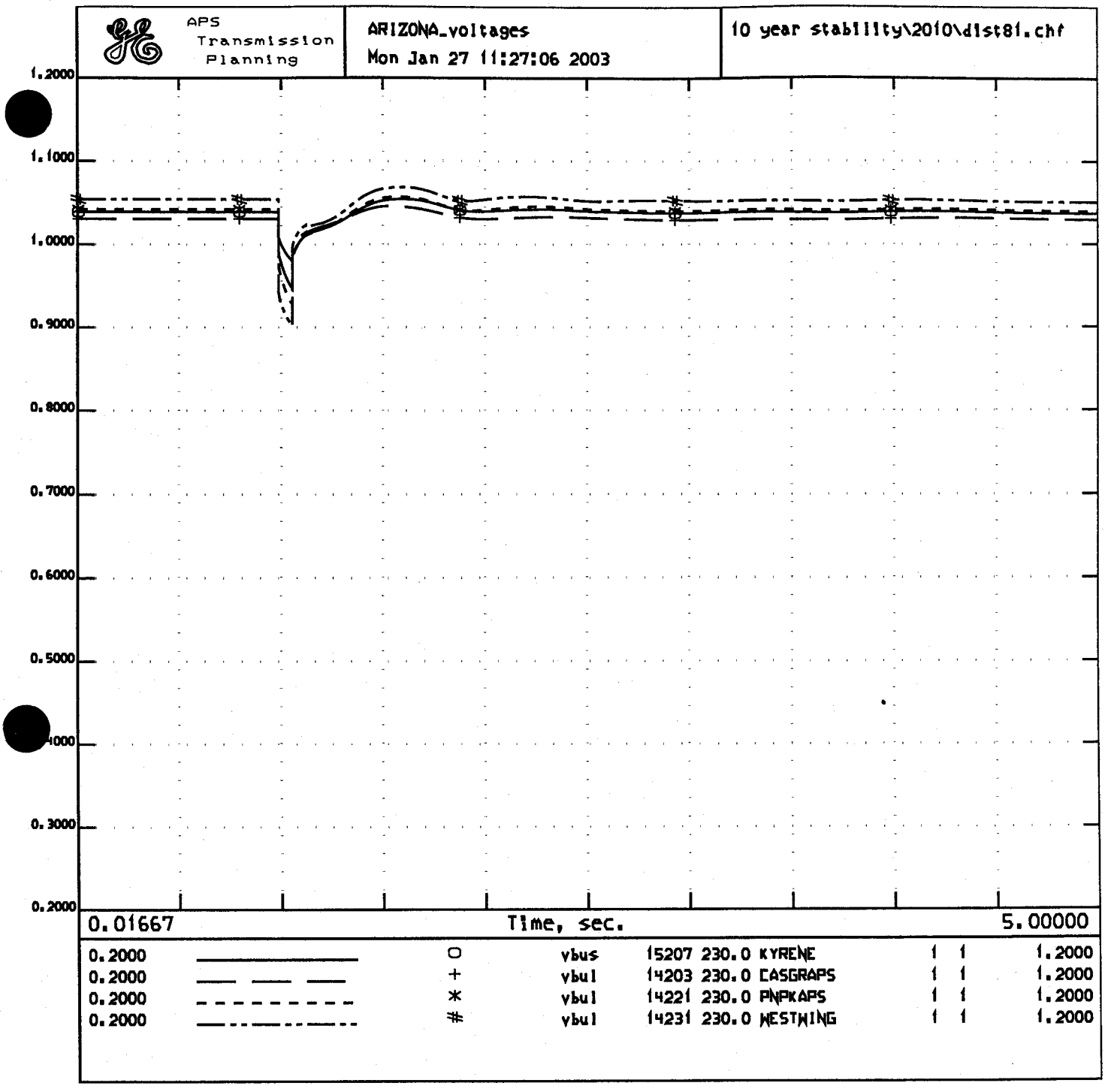
2010 Base Case for ACC 10-YR Stability Runs
NAV. FLT. Nav-Crystal line out
NOVEMBER 13, 2002
NAV-CRYS STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-CRYS;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



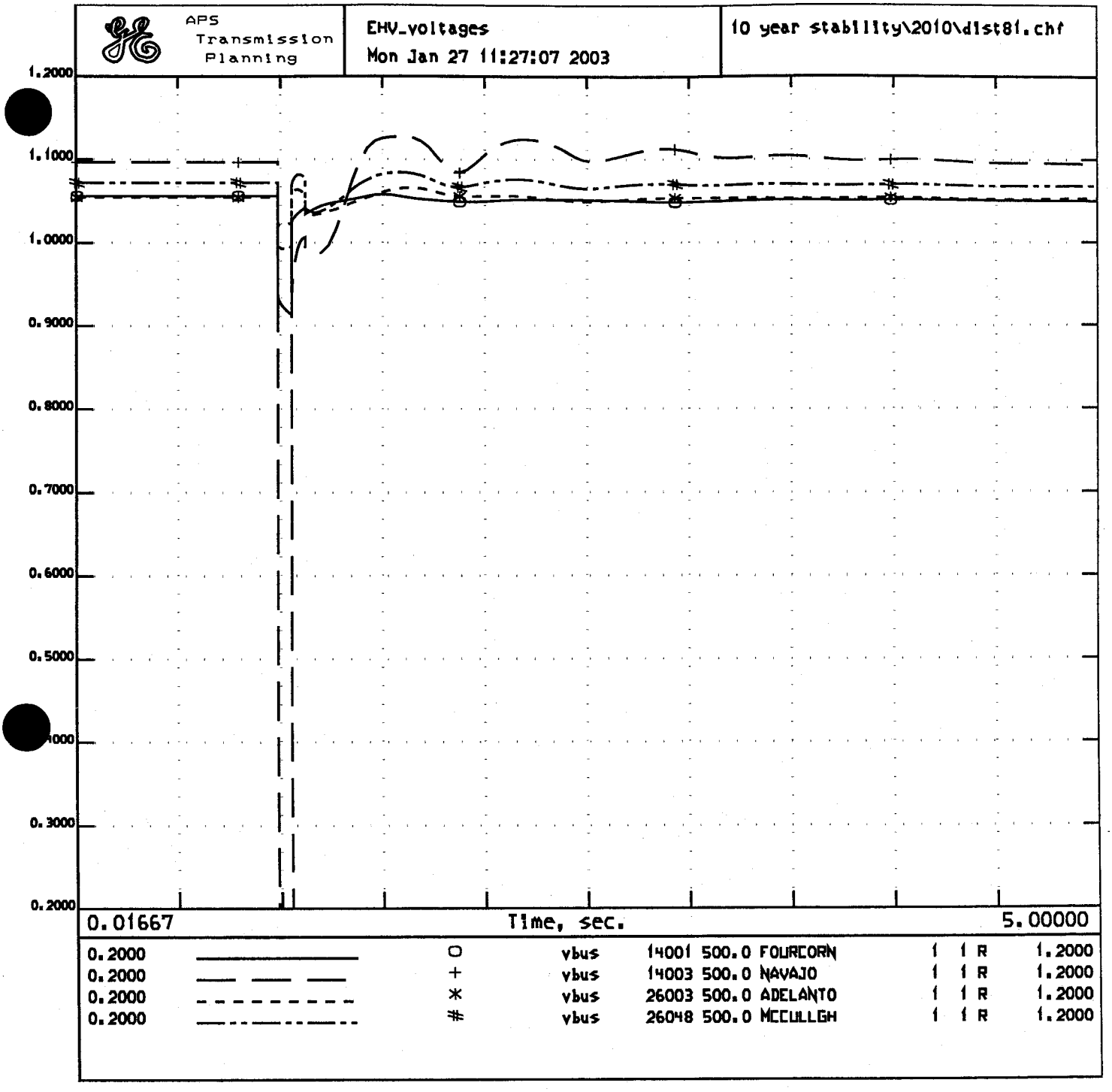
2010 Base Case for ACC 10-YR Stability Runs
NAV. FLT. Nav-Crystal line out
NOVEMBER 13, 2002
NAV-CRYS STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-CRYS;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



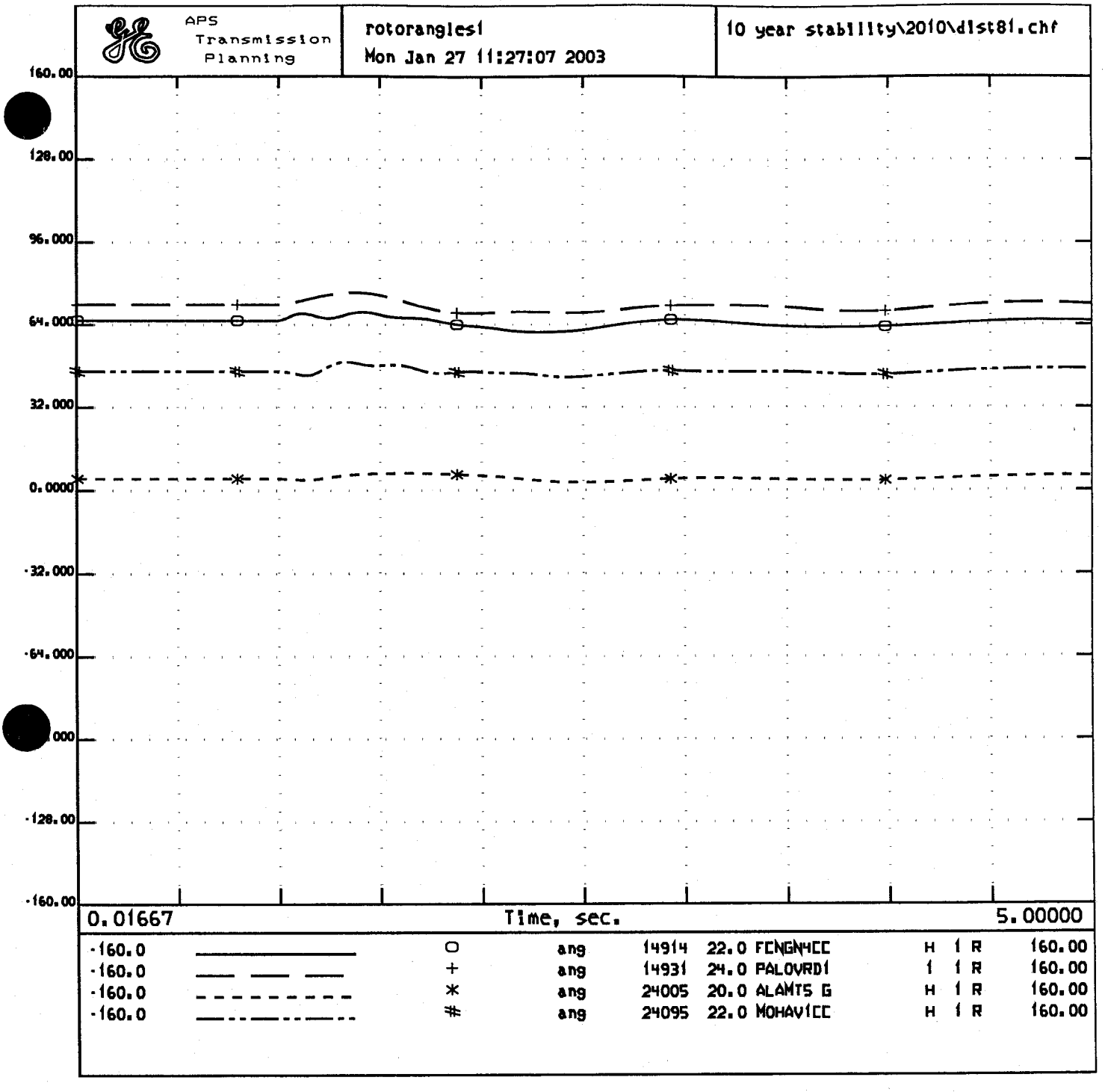
2010 Base Case for ACC 10-YR Stability Runs
NAV. FLT. Navjo-Mnk. line out
NOVEMBER 13, 2002
NAV-MKP STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-MKP;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



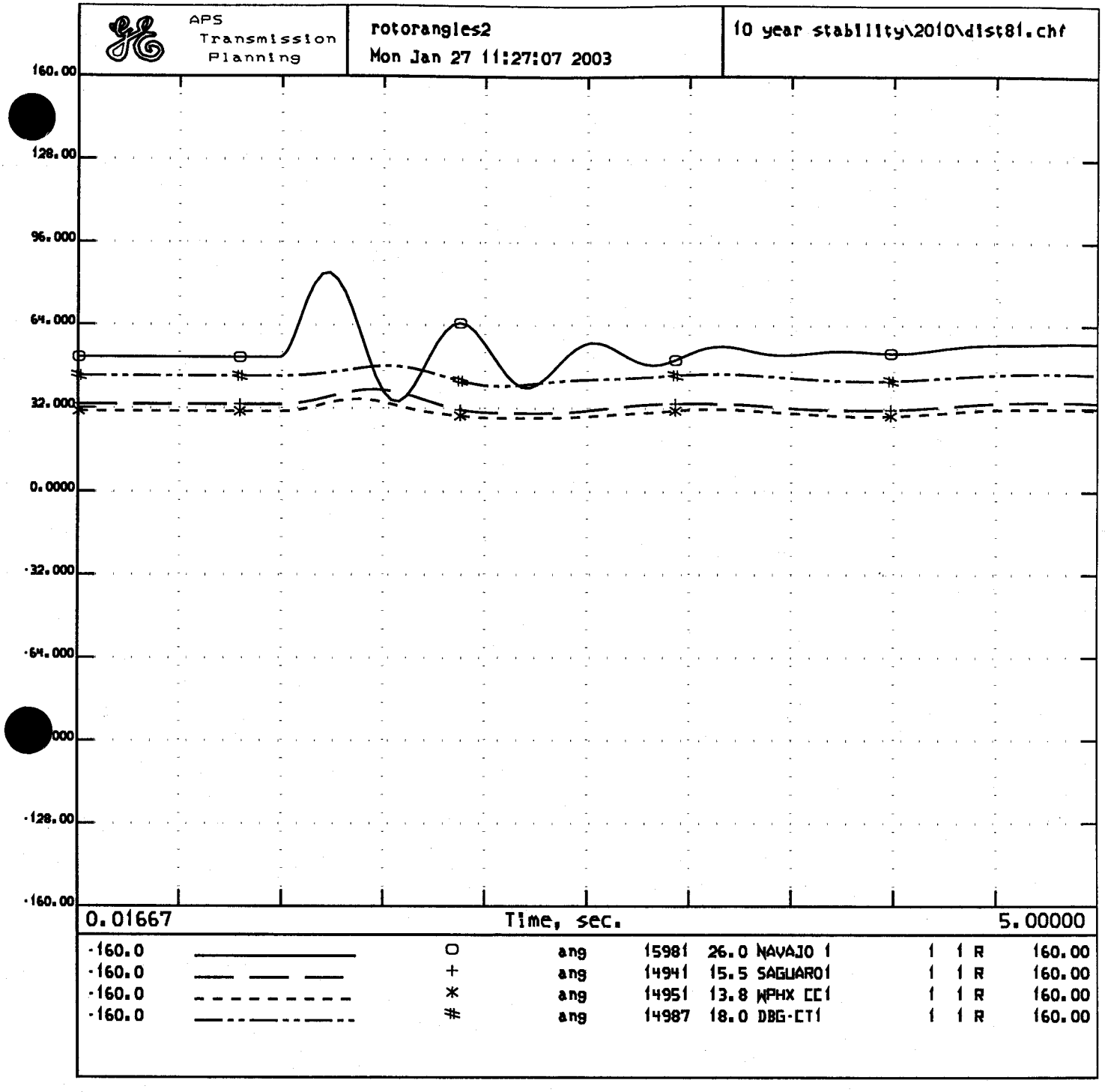
2010 Base Case for ACC 10-YR Stability Runs
NAV. FLT. Navjo-Mnk. line out
NOVEMBER 13, 2002
NAV-MKP STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-MKP;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



2010 Base Case for ACC 10-YR Stability Runs
NAV. FLT. Navjo-Mnk. line out
NOVEMBER 13, 2002
NAV-MKP STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-MKP;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



2010 Base Case for ACC 10-YR Stability Runs
NAV. FLT. Navjo-Mnk. line out
NOVEMBER 13, 2002
NAV-MKP STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-MKP;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
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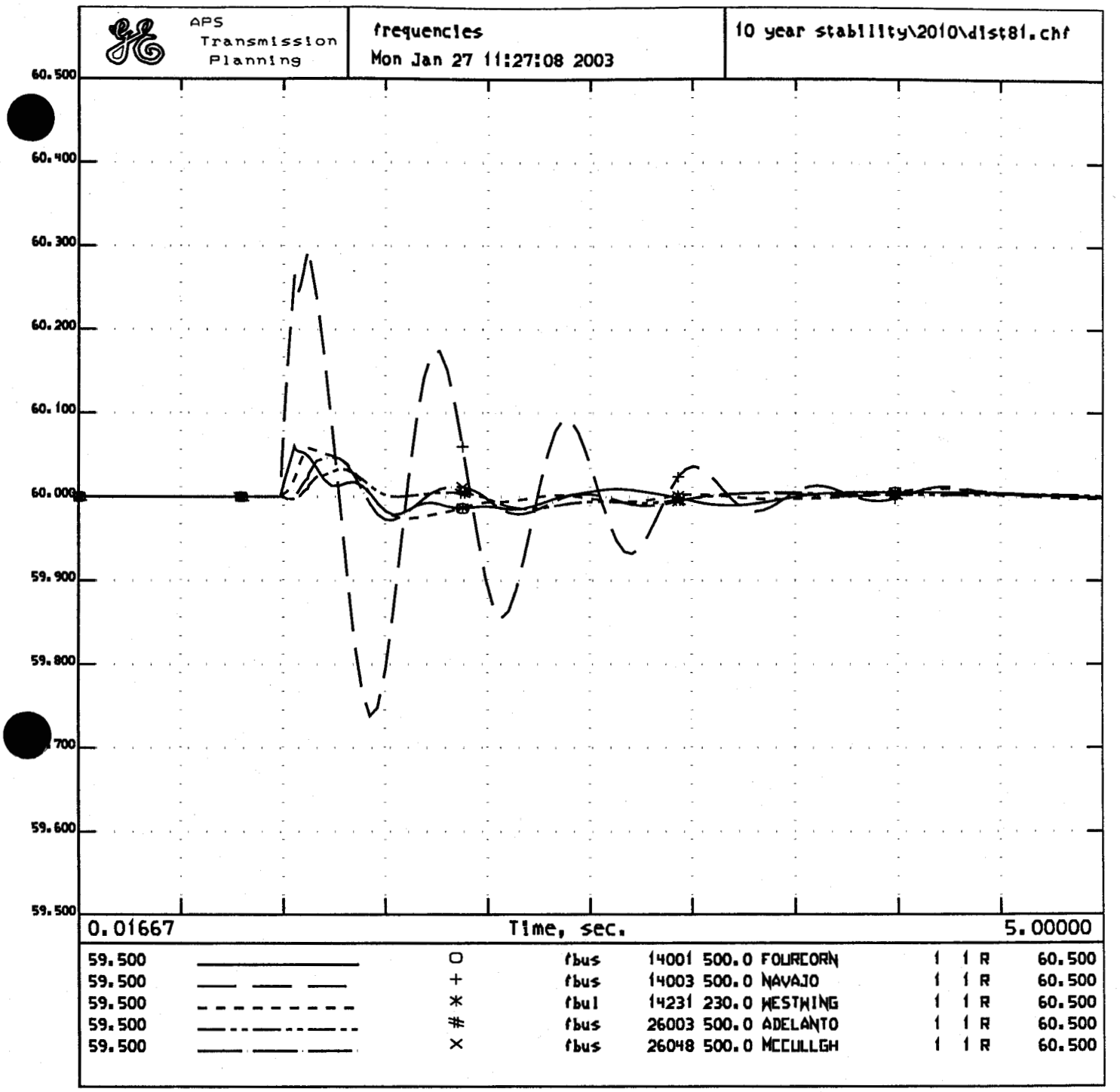
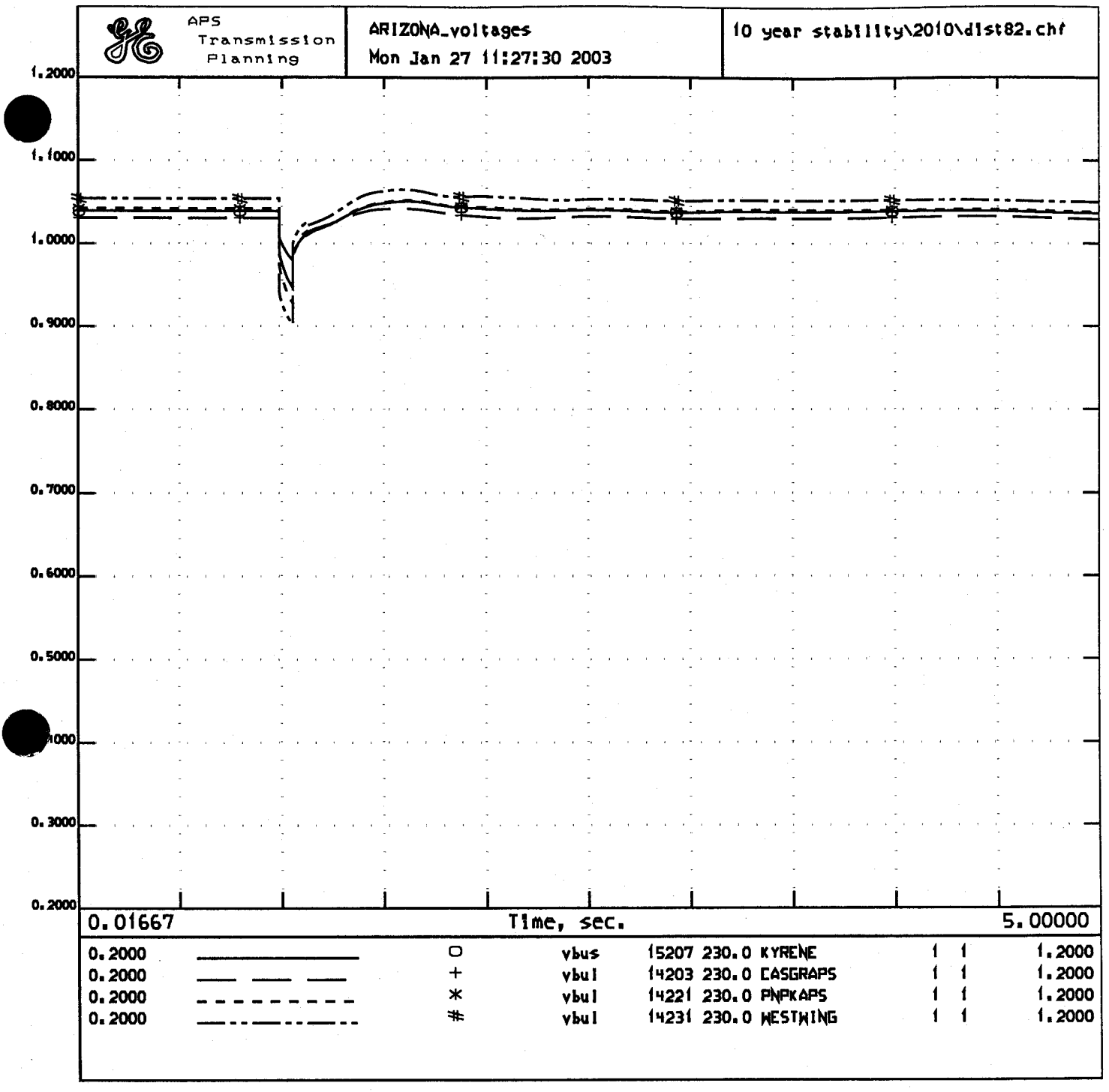


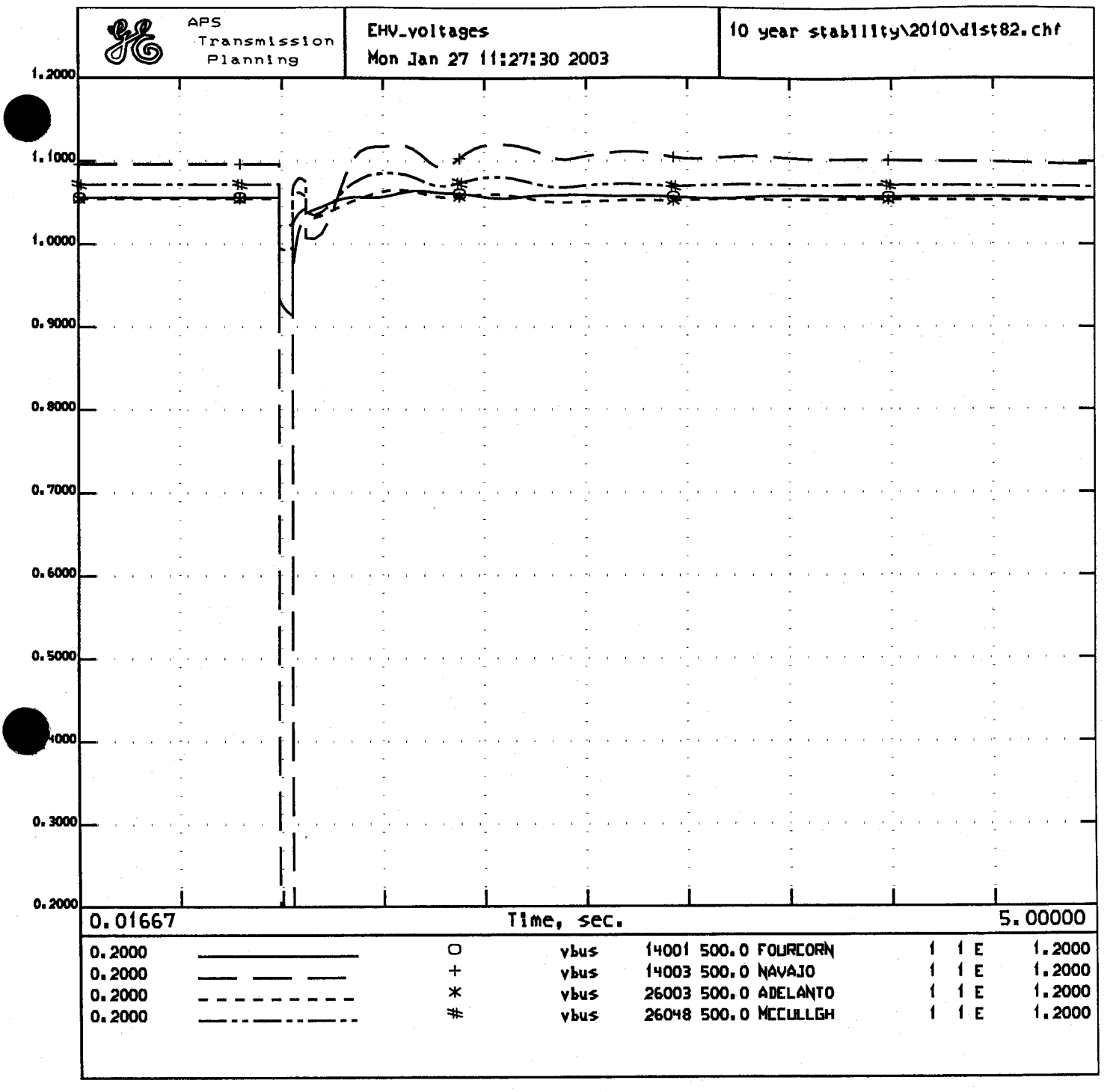
2010 Base Case for ACC 10-YR Stability Runs
NAV. FLT. Navjo-Mnk. line out
NOVEMBER 13, 2002
NAV-MKP STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-MKP;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



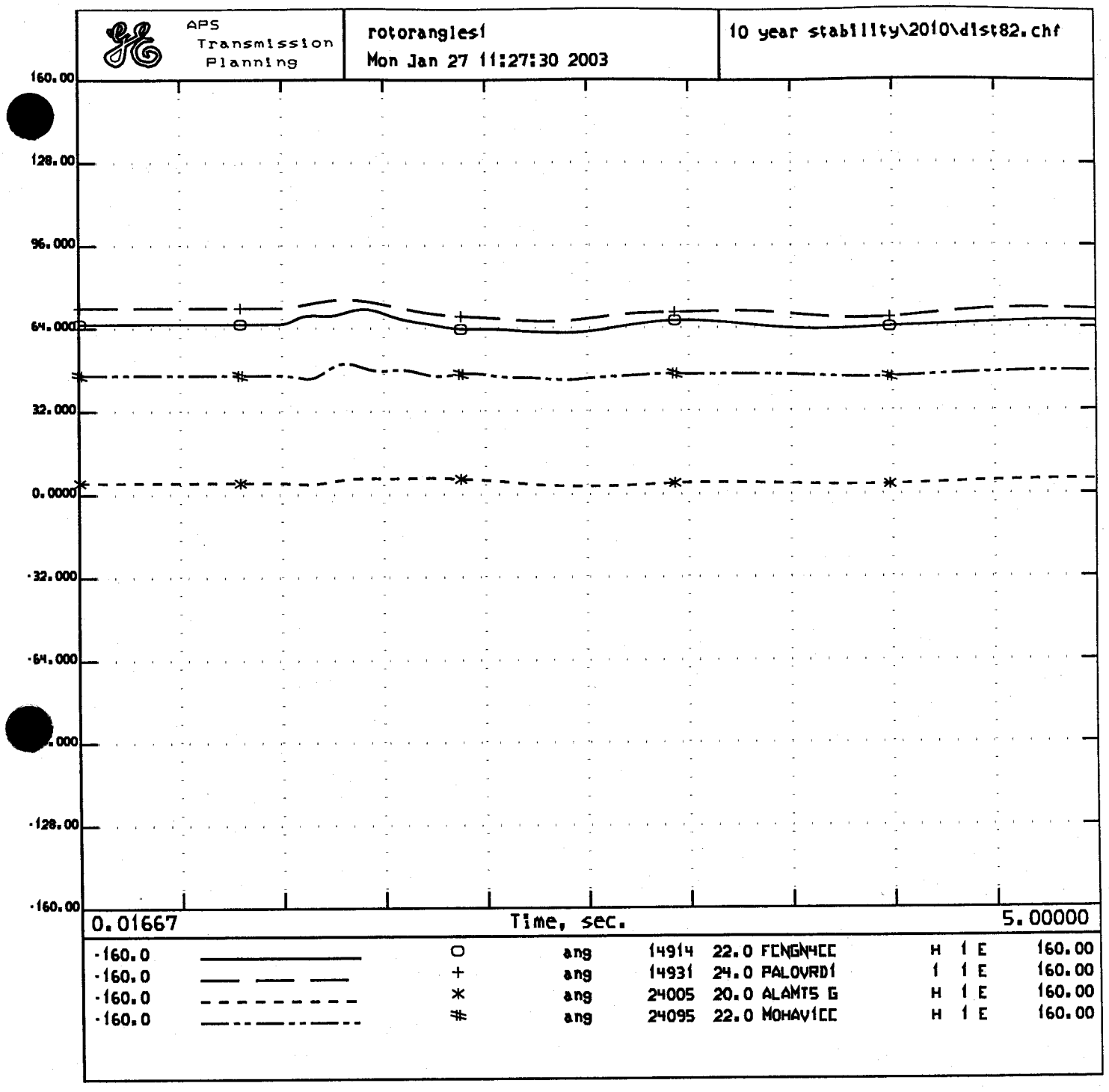
NAV FLT NAV-TM LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
NAV-TM STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-TM;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



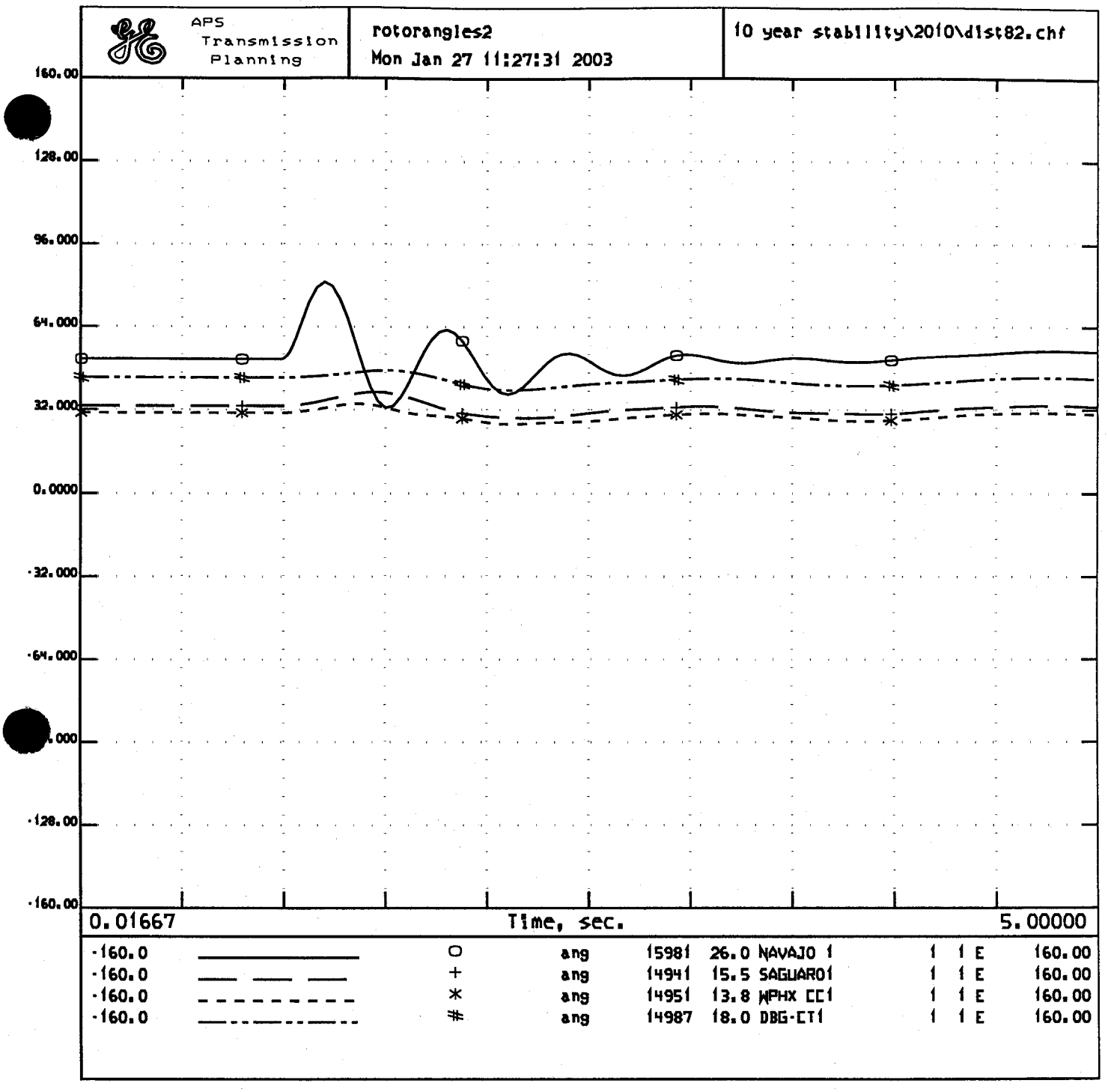
NAV FLT NAV-TM LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
NAV-TM STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-TM;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



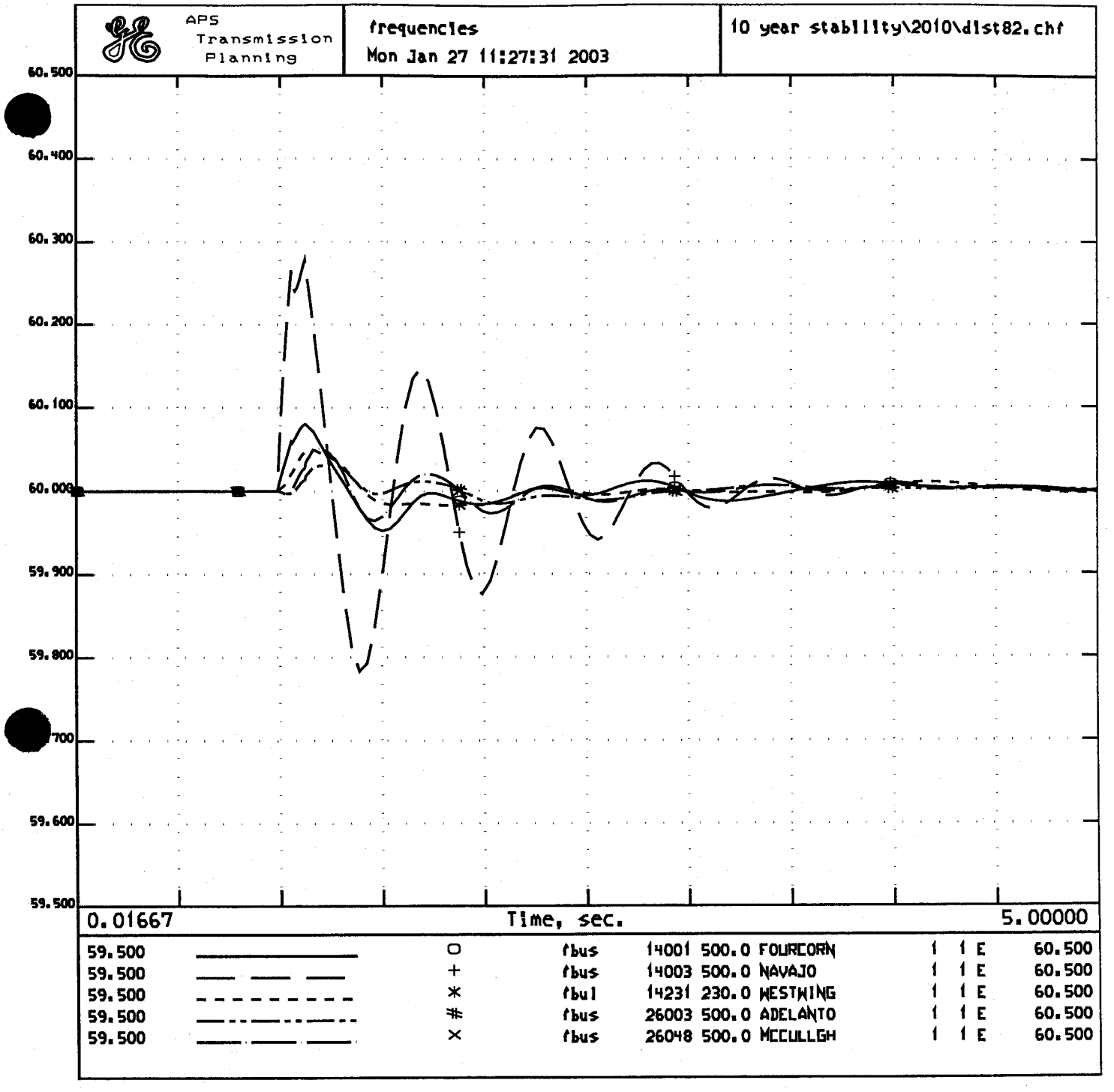
NAV FLT NAV-TM LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
NAV-TM STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-TM;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



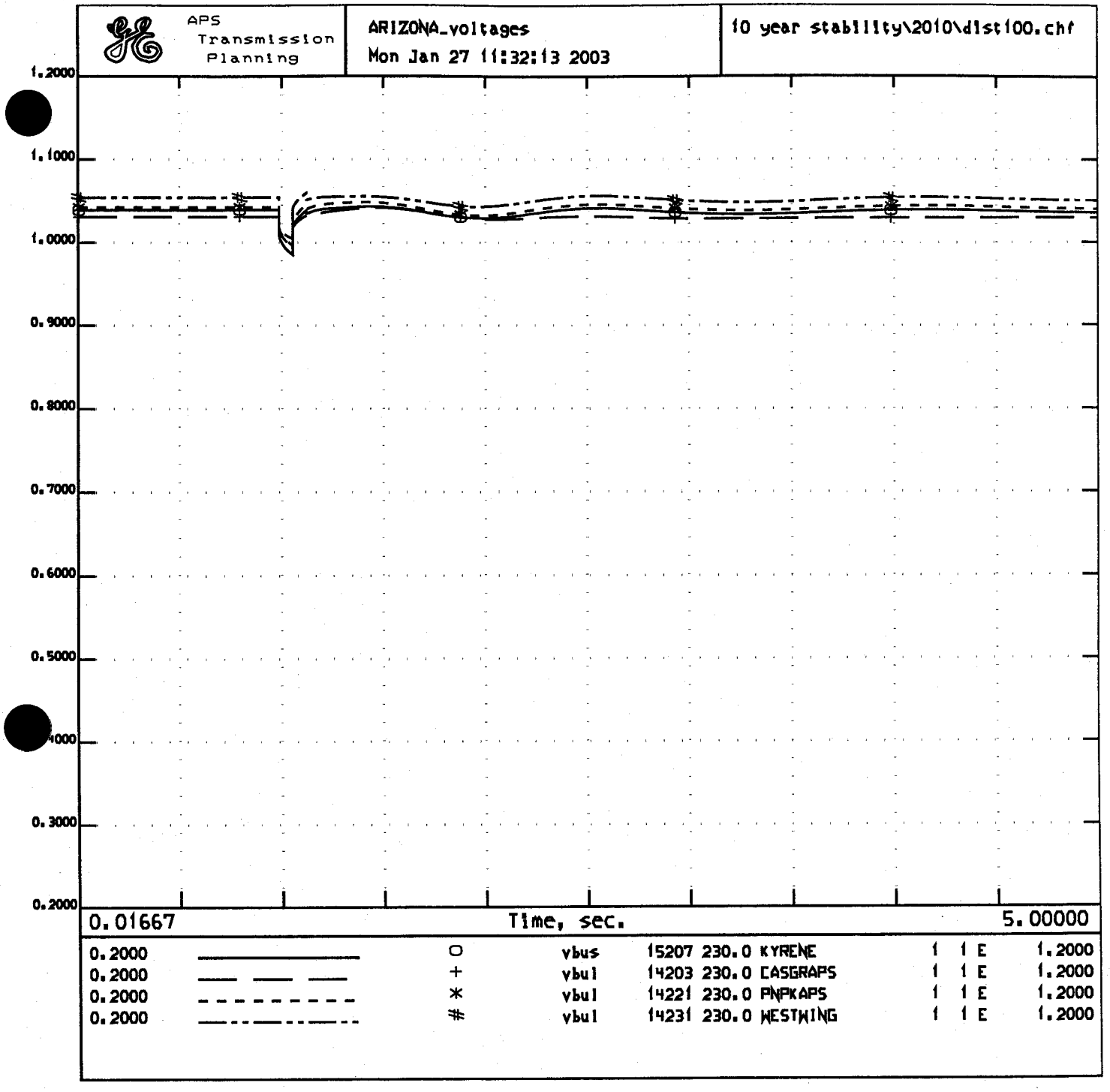
NAV FLT NAV-TM LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
NAV-TM STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-TM;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



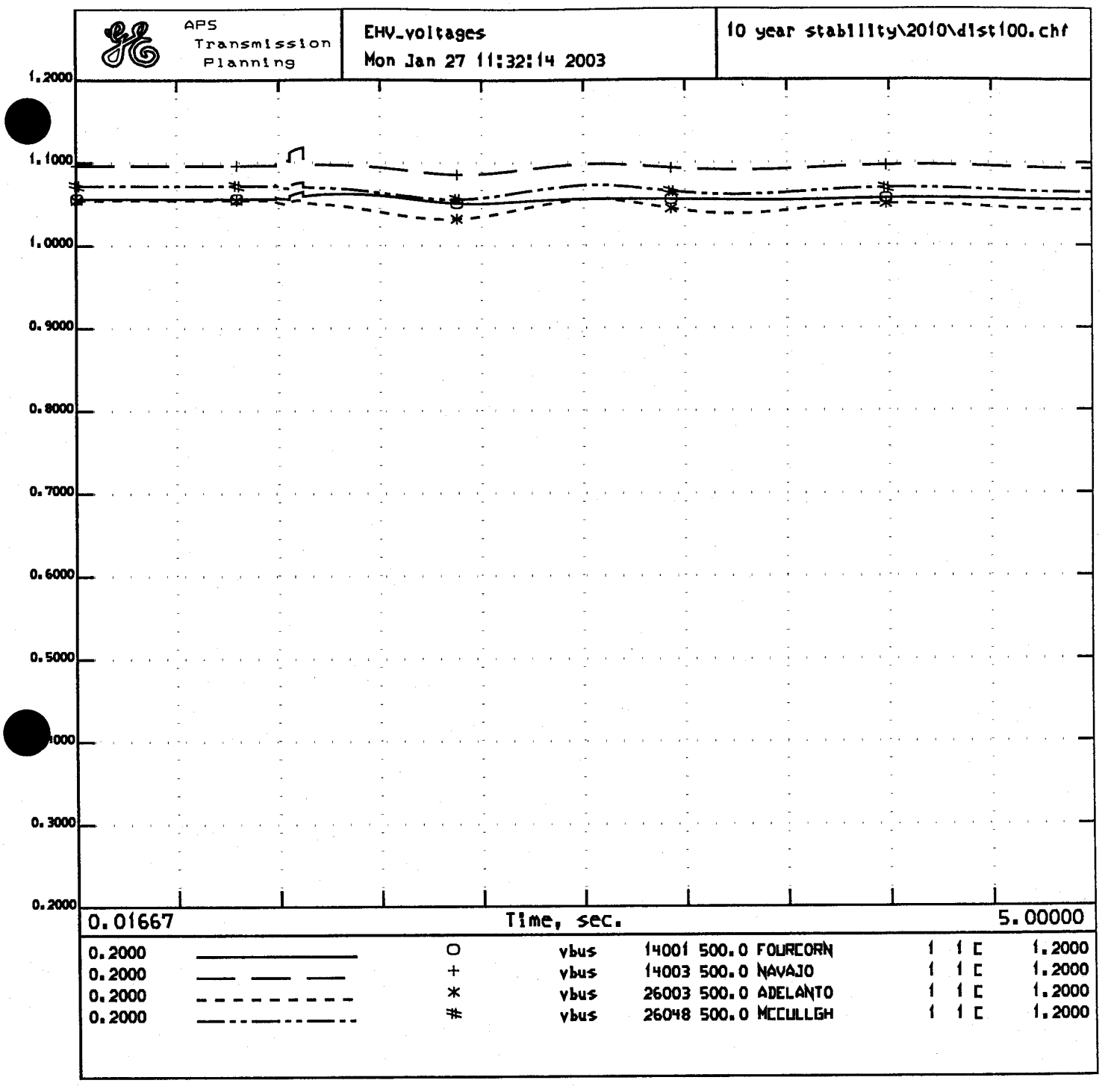
NAV FLT NAV-TM LINE OUT
Originally the 2007 HSIA APPROVED BASE CASE
NOVEMBER 13, 2002
NAV-TM STAB; 1/03; T=0 3P FLT NAV500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-TM;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



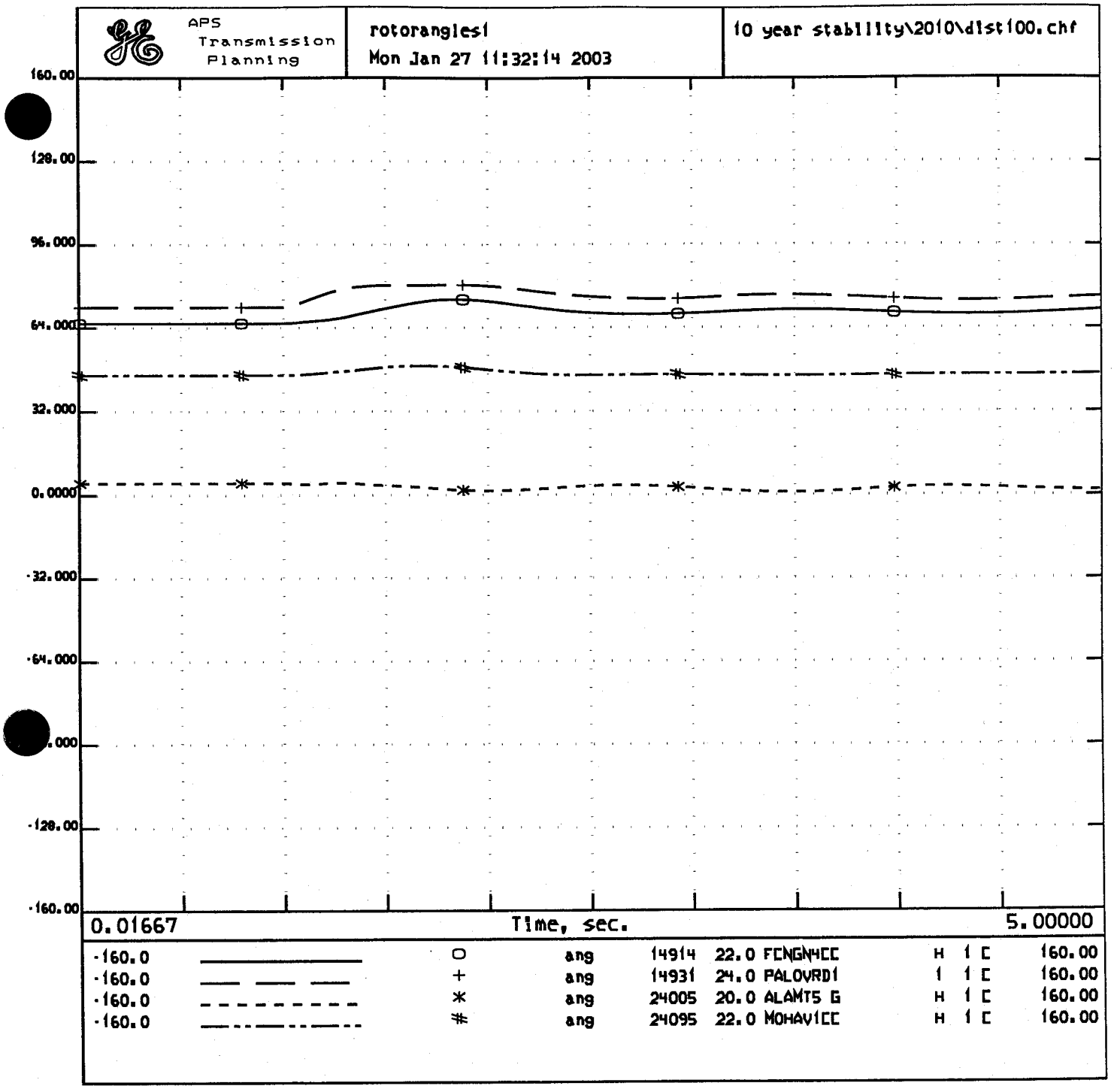
N.GILA FLT HASSY-N.GILA LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
N.GILA STAB,3 PH FLT N.GILA 500KV
FLASH CAPS,W/4 CYC CLR FLT;HASSY-NG OUT;4/8 CYC REIN CAPS

Updated the system rep. to 2010.
Updated the loads to 2010 level.



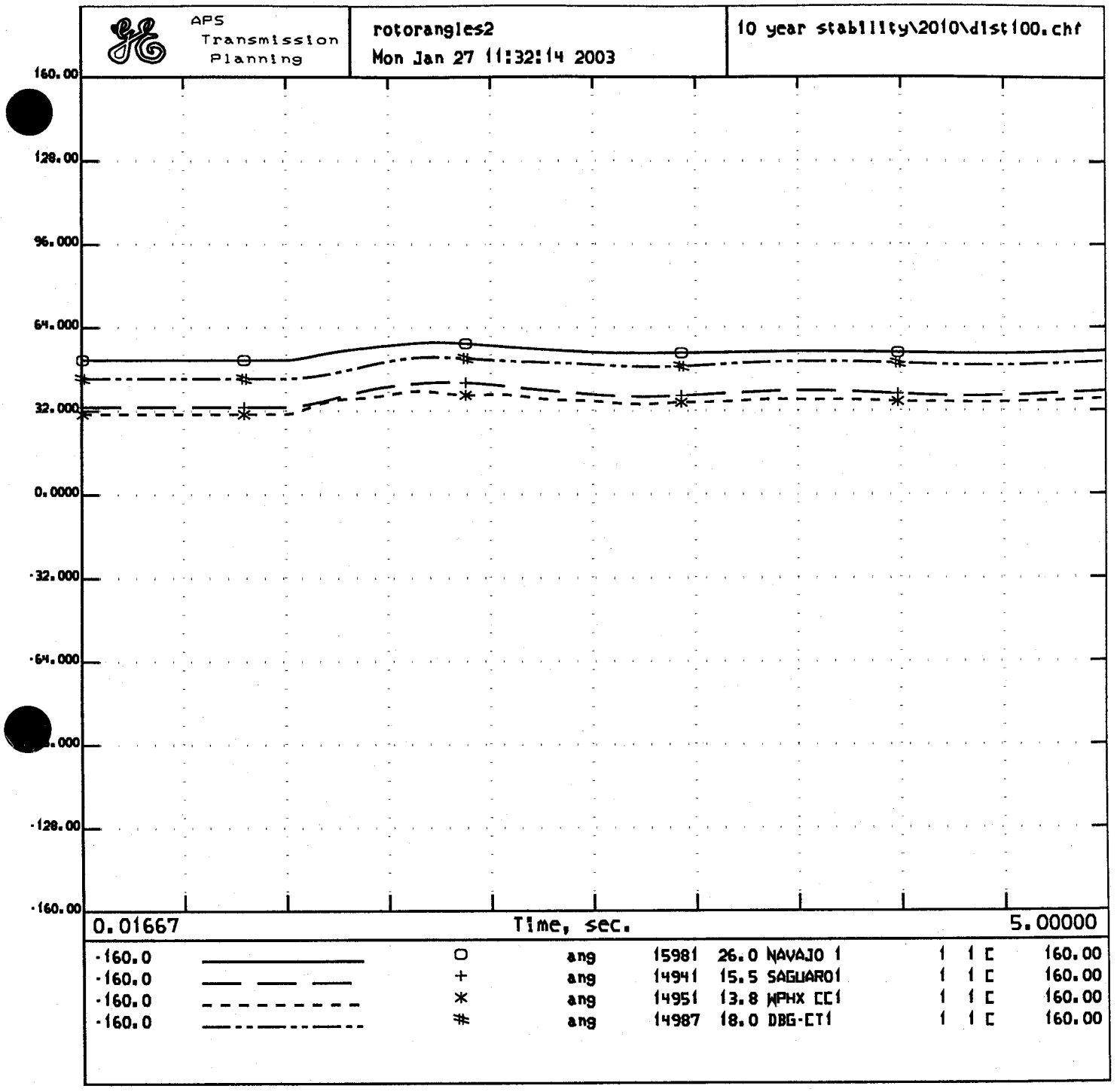
N.GILA FLT HASSY-N.GILA LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
N.GILA STAB,3 PH FLT N.GILA 500KV
FLASH CAPS,W/4 CYC CLR FLT;HASSY-NG OUT;4/8 CYC REIN CAPS

Updated the system rep. to 2010.
Updated the loads to 2010 level.



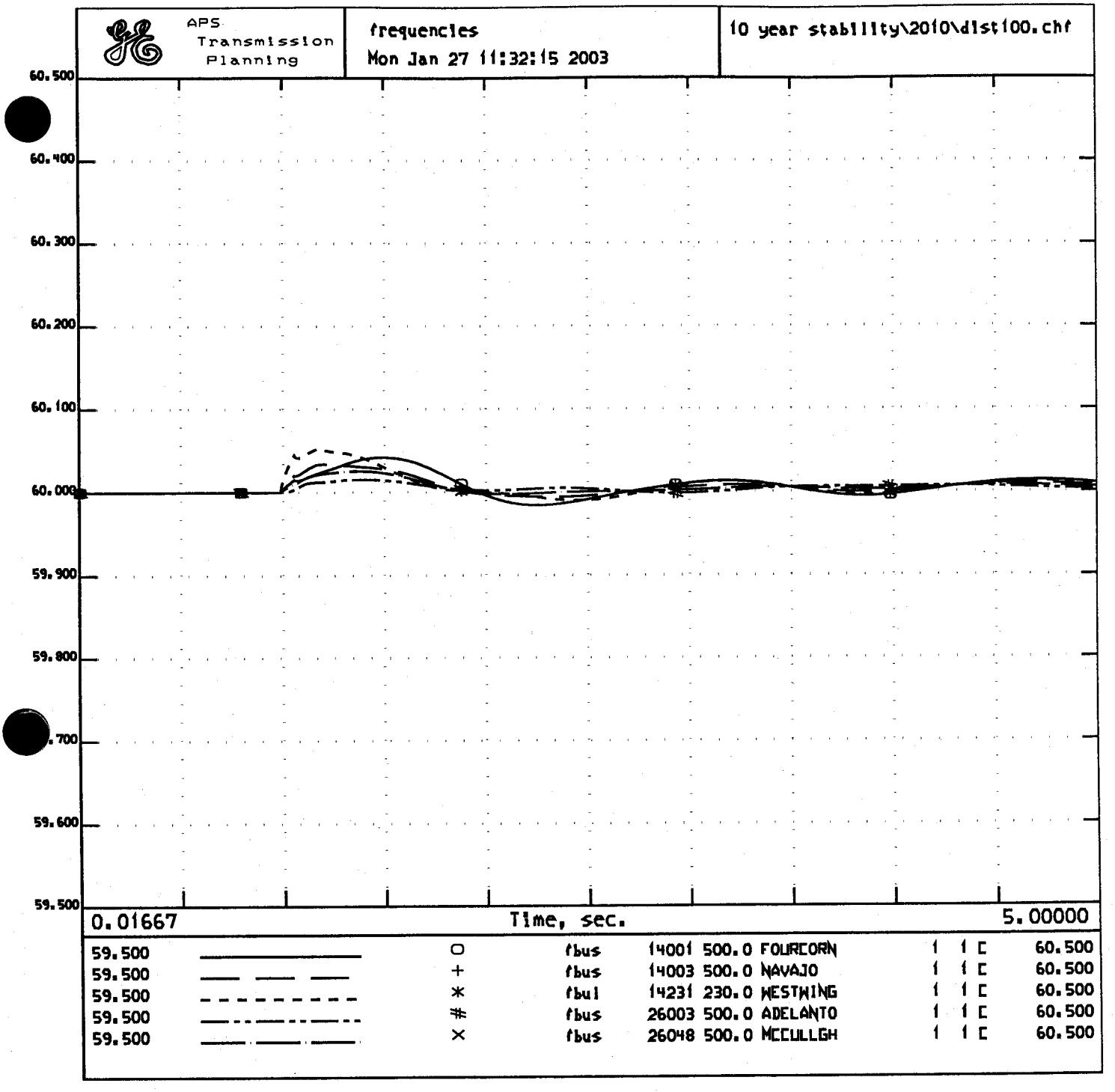
N.GILA FLT HASSY-N.GILA LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
N.GILA STAB,3 PH FLT N.GILA 500KV
FLASH CAPS,W/4 CYC CLR FLT;HASSY-NG OUT;4/8 CYC REIN CAPS

Updated the system rep. to 2010.
Updated the loads to 2010 level.



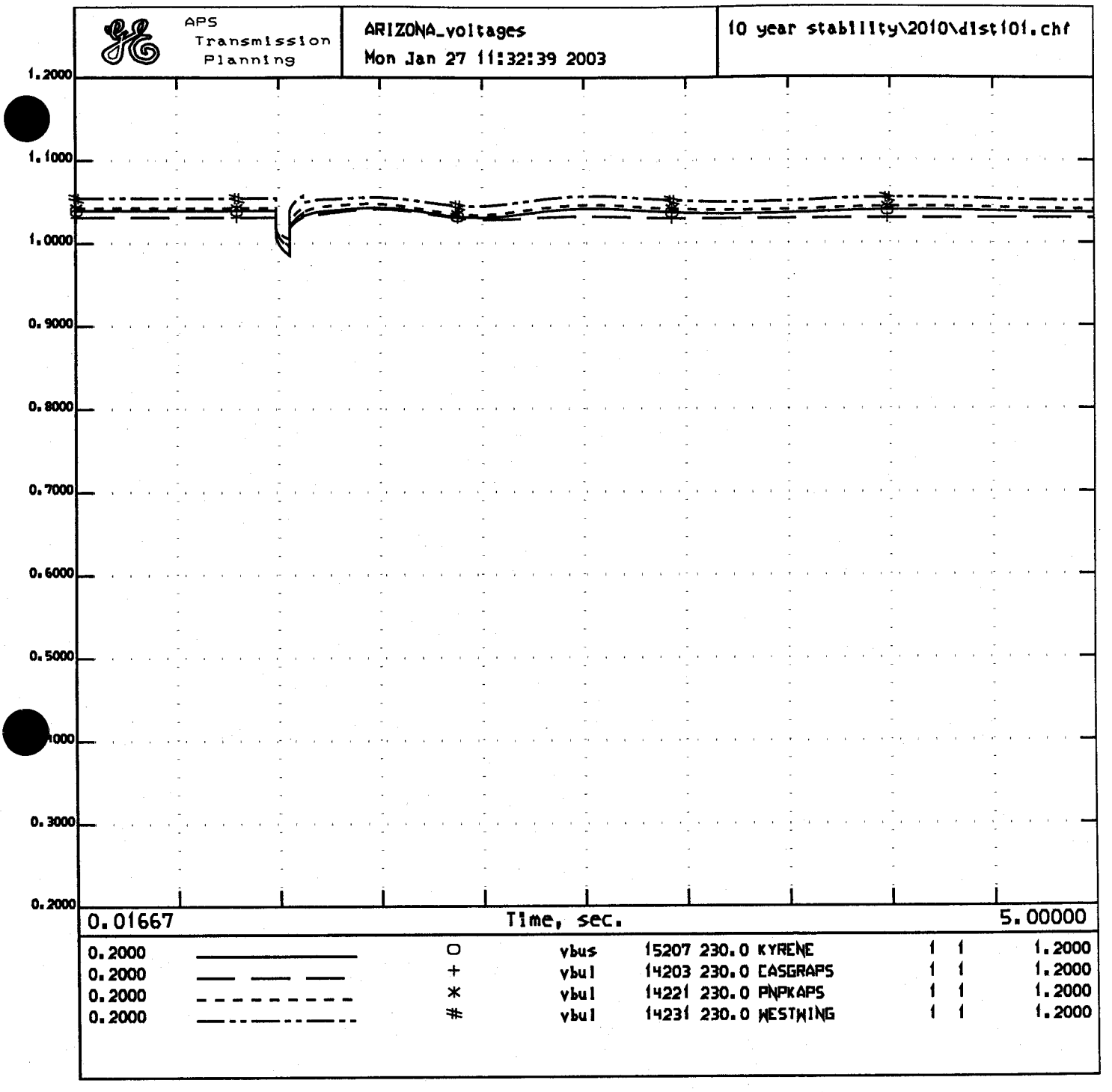
N.GILA FLT HASSY-N.GILA LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
N.GILA STAB,3 PH FLT N.GILA 500KV
FLASH CAPS,W/4 CYC CLR FLT;HASSY-NG OUT;4/8 CYC REIN CAPS

Updated the system rep. to 2010.
Updated the loads to 2010 level.



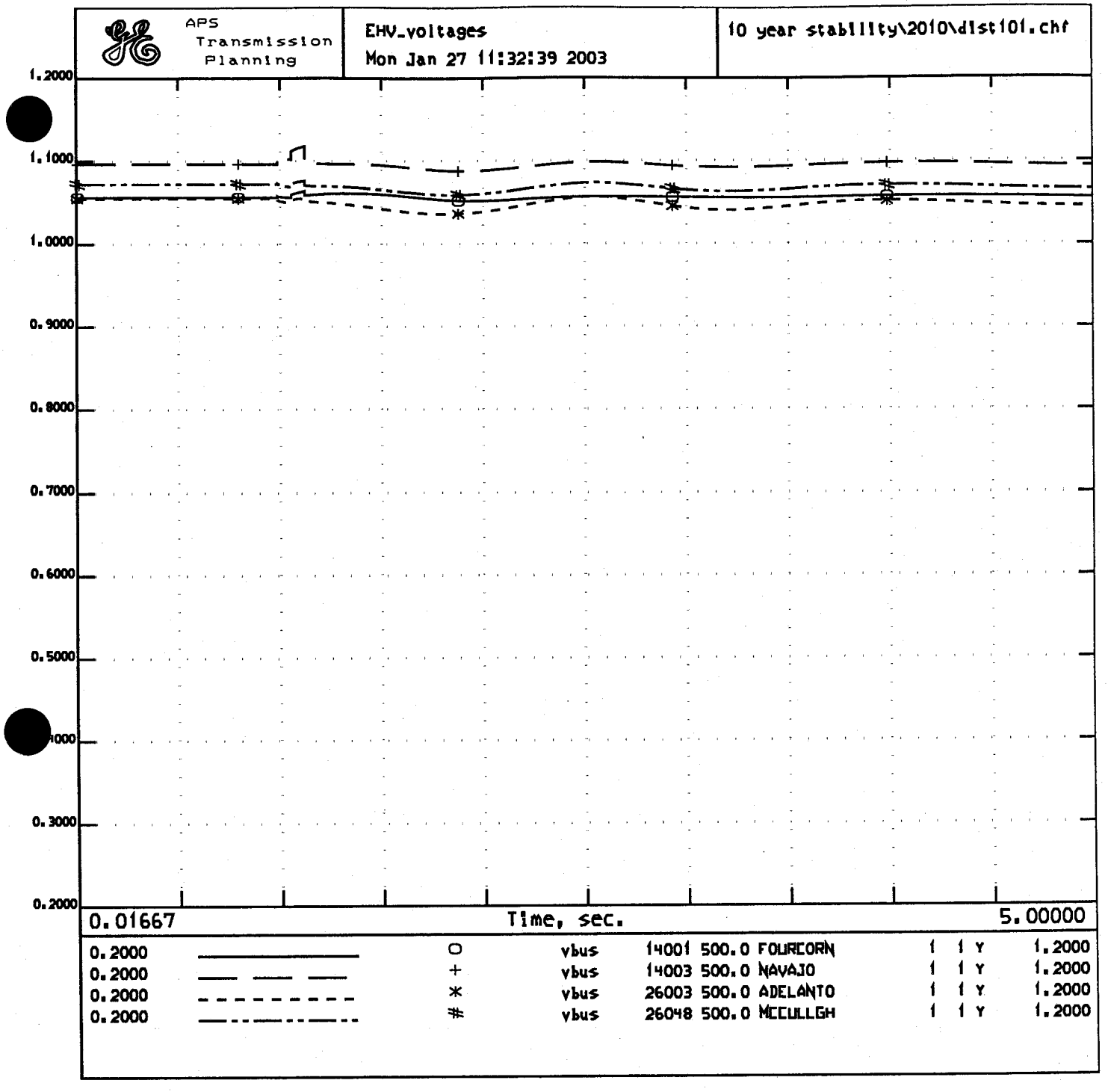
N.GILA FLT HASSY-N.GILA LINE OUT
Originally the 2007 HSIA APPROVED BASE CASE
NOVEMBER 13, 2002
N.GILA STAB,3 PH FLT N.GILA 500KV
FLASH CAPS,W/4 CYC CLR FLT;HASSY-NG OUT;4/8 CYC REIN CAPS

Updated the system rep. to 2010.
Updated the loads to 2010 level.



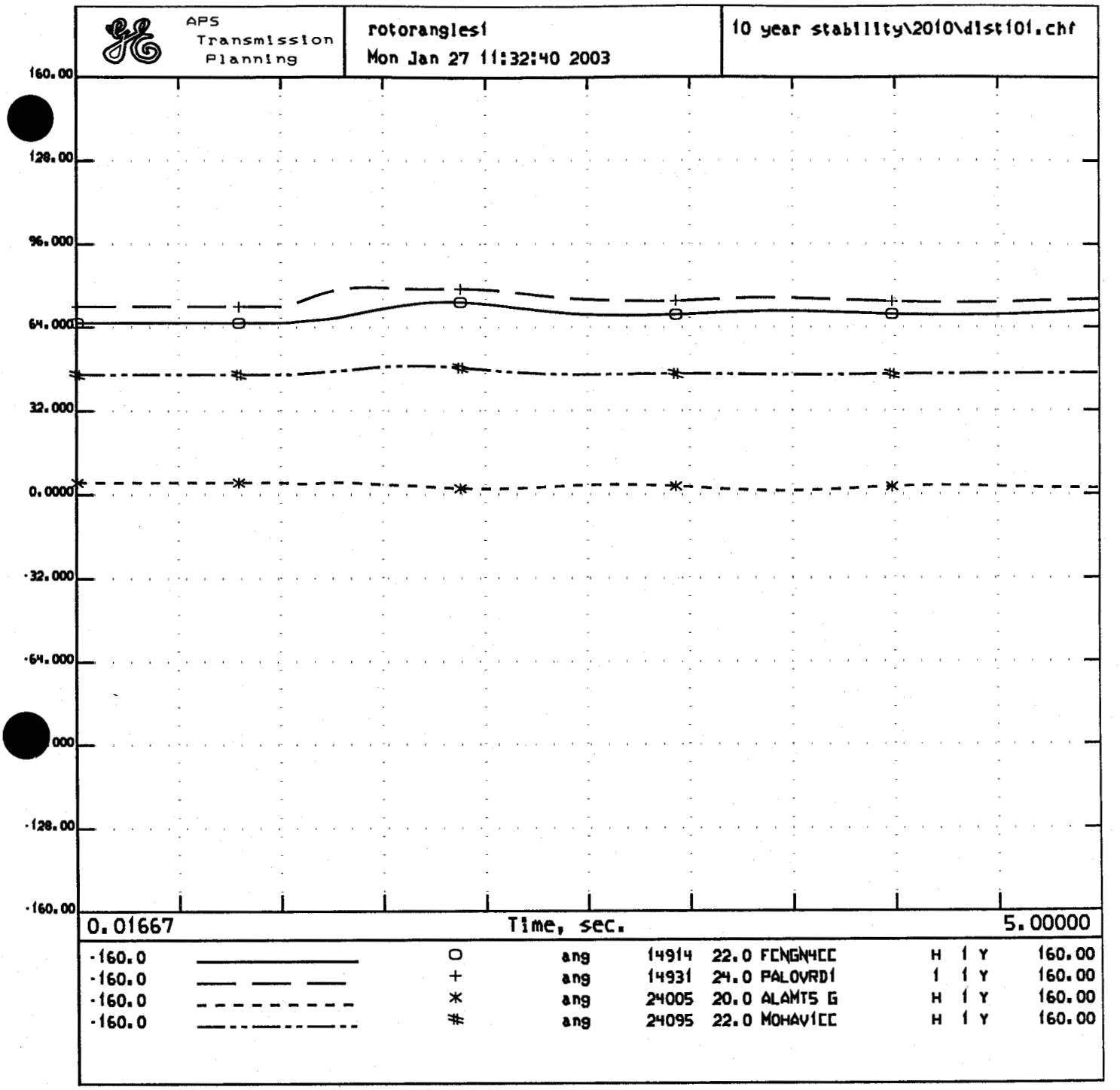
N.GILA FLT IMP. V-N.GILA LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
N.GILA STAB,3 PH FLT N.GILA 500KV
FLASH CAPS,W/4 CYC CLR FLT;IMPV-NG OUT;4/8 CYC REIN CAPS

Updated the system rep. to 2010.
Updated the loads to 2010 level.



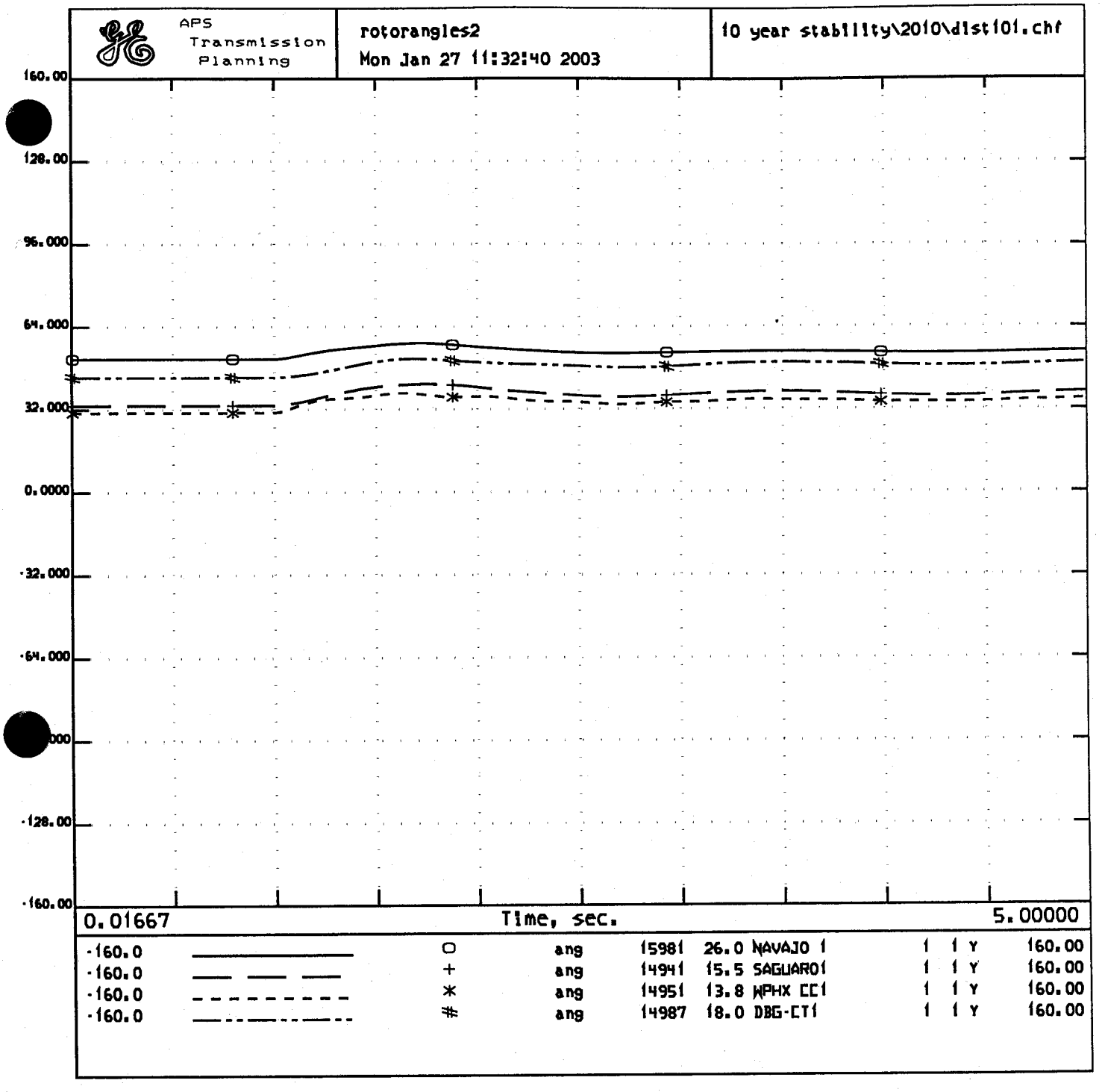
N.GILA FLT IMP. V-N.GILA LINE OUT
Originally the 2007 HSIA APPROVED BASE CASE
NOVEMBER 13, 2002
N.GILA STAB,3 PH FLT N.GILA 500KV
FLASH CAPS,W/4 CYC CLR FLT;IMPV-NG OUT;4/8 CYC REIN CAPS

Updated the system rep. to 2010.
Updated the loads to 2010 level.



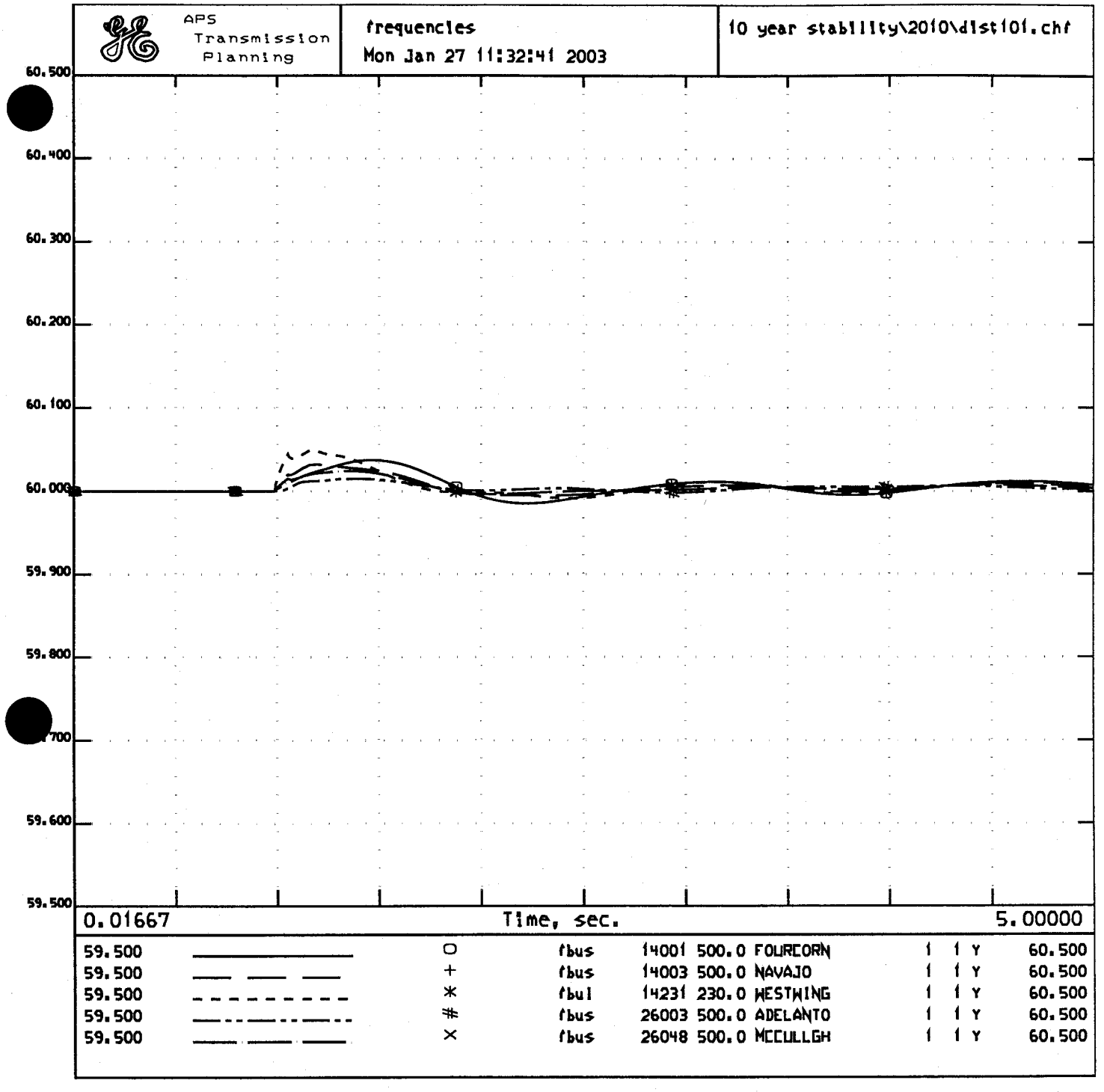
N.GILA FLT IMP. V-N.GILA LINE OUT
Originally the 2007 HSIA APPROVED BASE CASE
NOVEMBER 13, 2002
N.GILA STAB,3 PH FLT N.GILA 500KV
FLASH CAPS,W/4 CYC CLR FLT;IMPV-NG OUT;4/8 CYC REIN CAPS

Updated the system rep. to 2010.
Updated the loads to 2010 level.



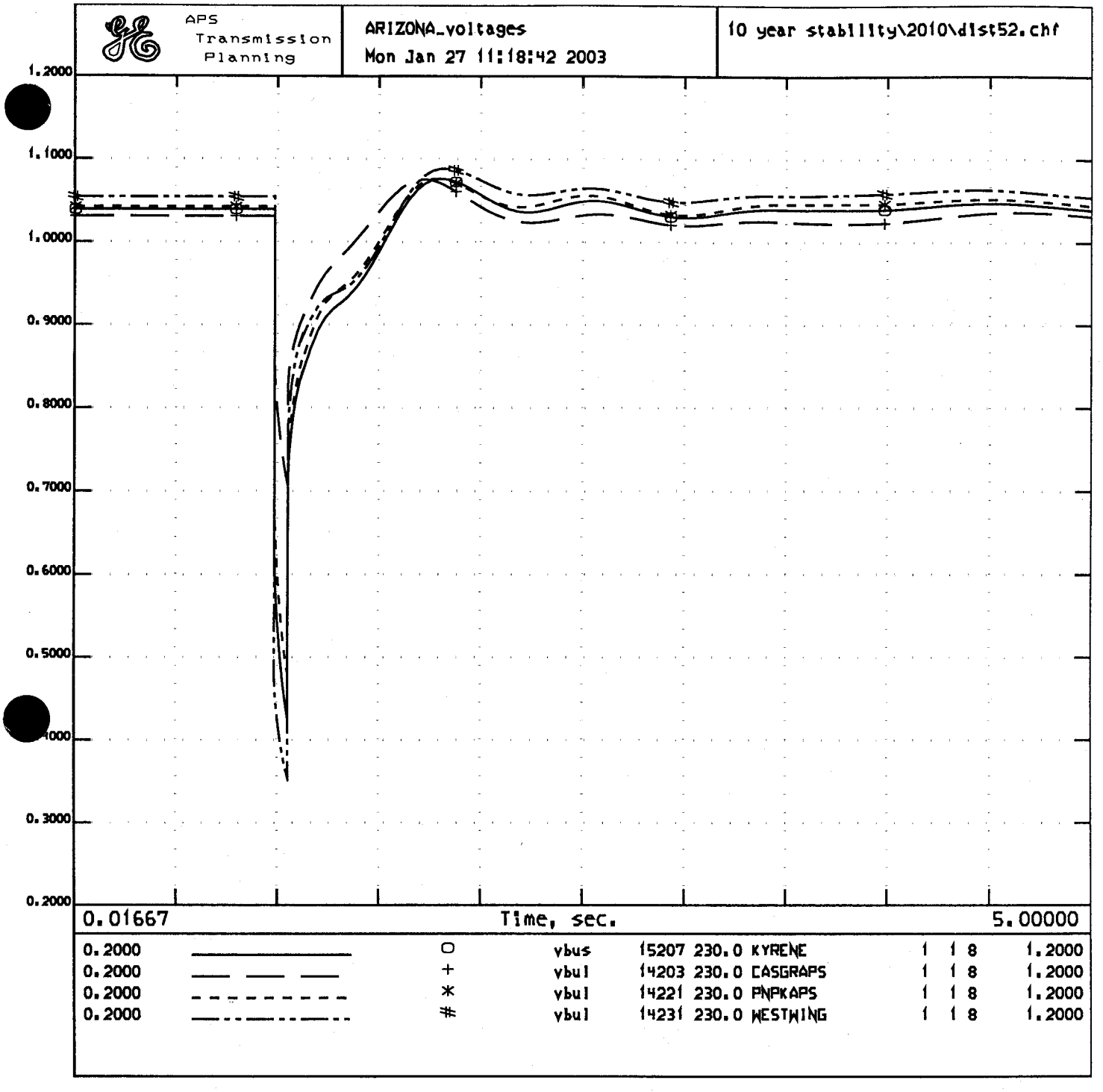
N.GILA FLT IMP. V-N.GILA LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
N.GILA STAB,3 PH FLT N.GILA 500KV
FLASH CAPS,W/4 CYC CLR FLT;IMPV-NG OUT;4/8 CYC REIN CAPS

Updated the system rep. to 2010.
Updated the loads to 2010 level.



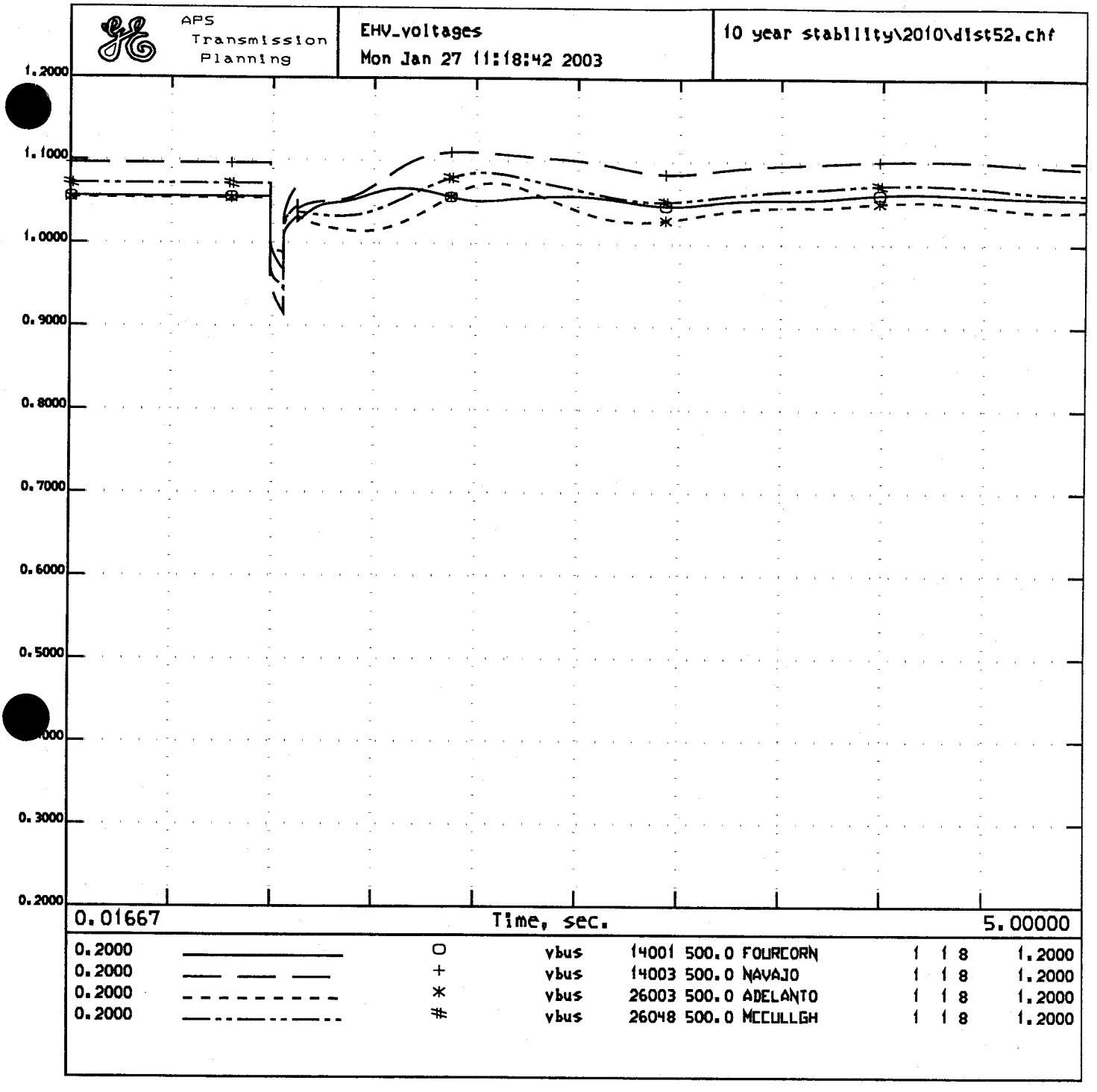
N.GILA FLT IMP. V-N.GILA LINE OUT
Originally the 2007 HSIA APPROVED BASE CASE
NOVEMBER 13, 2002
N.GILA STAB,3 PH FLT N.GILA 500KV
FLASH CAPS,W/4 CYC CLR FLT;IMPV-NG OUT;4/8 CYC REIN CAPS

Updated the system rep. to 2010.
Updated the loads to 2010 level.



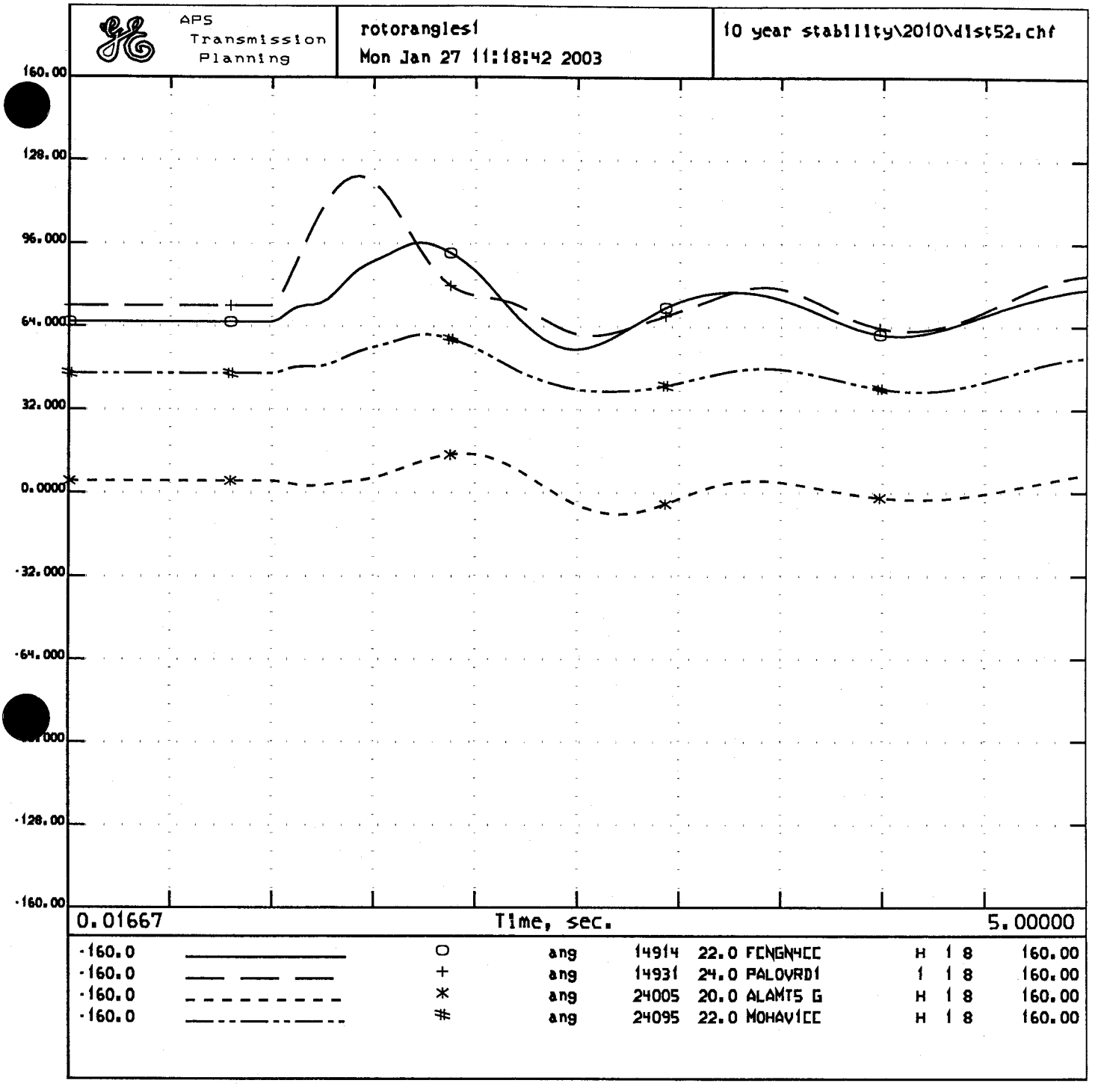
2010 Base Case for ACC 10-YR Stability Runs
PV FLT. W/PV - Devers line out
NOVEMBER 13, 2002
PV-DEV STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-DEV8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



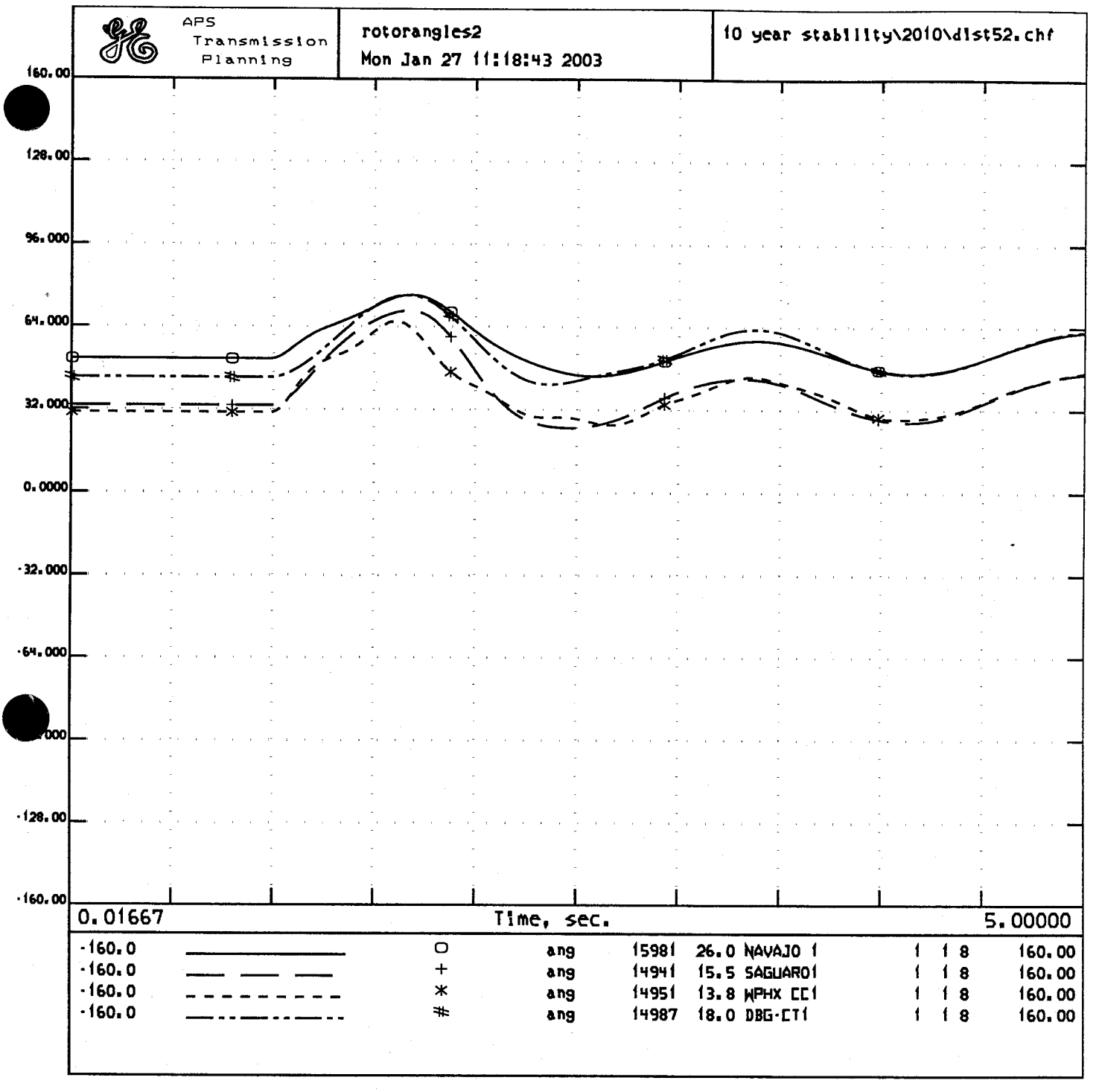
2010 Base Case for ACC 10-YR Stability Runs
PV FLT. w/PV - Devers line out
NOVEMBER 13, 2002
PV-DEV STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-DEV8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



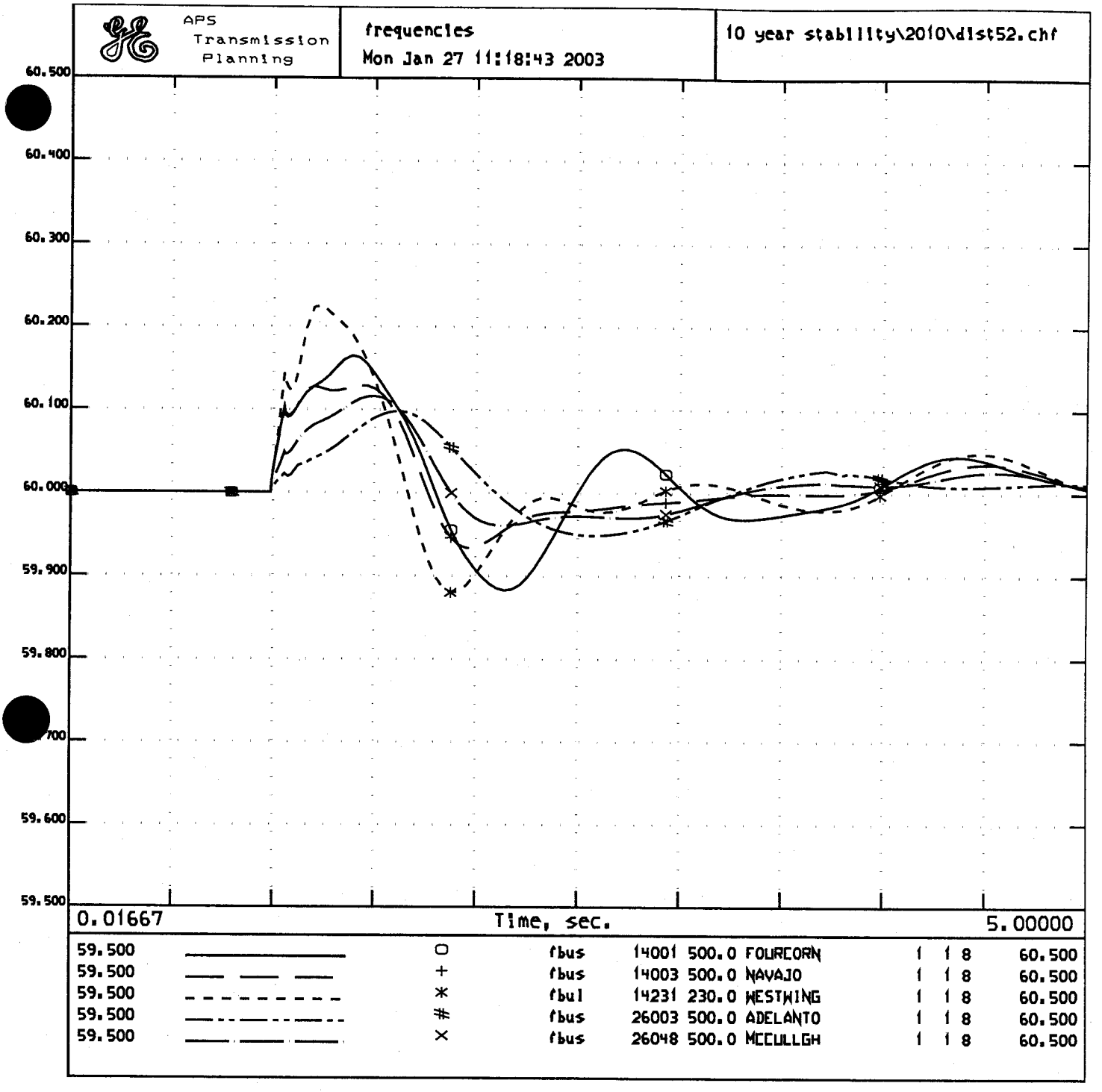
2010 Base Case for ACC 10-YR Stability Runs
PV FLT. w/PV - Devers line out
NOVEMBER 13, 2002
PV-DEV STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-DEV8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



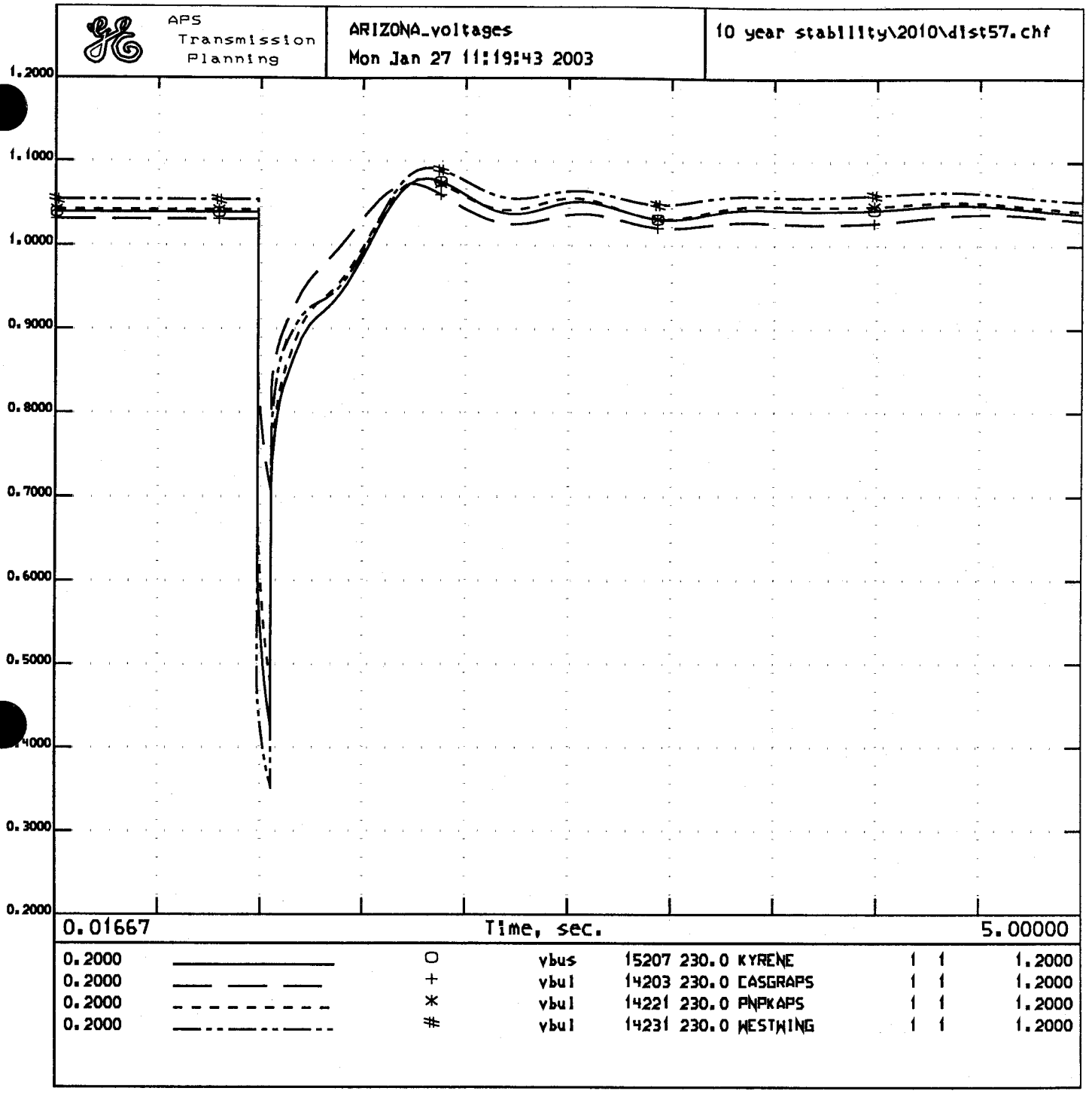
2010 Base Case for ACC 10-YR Stability Runs
PV FLT. w/PV - Devers line out
NOVEMBER 13, 2002
PV-DEV STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-DEV8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



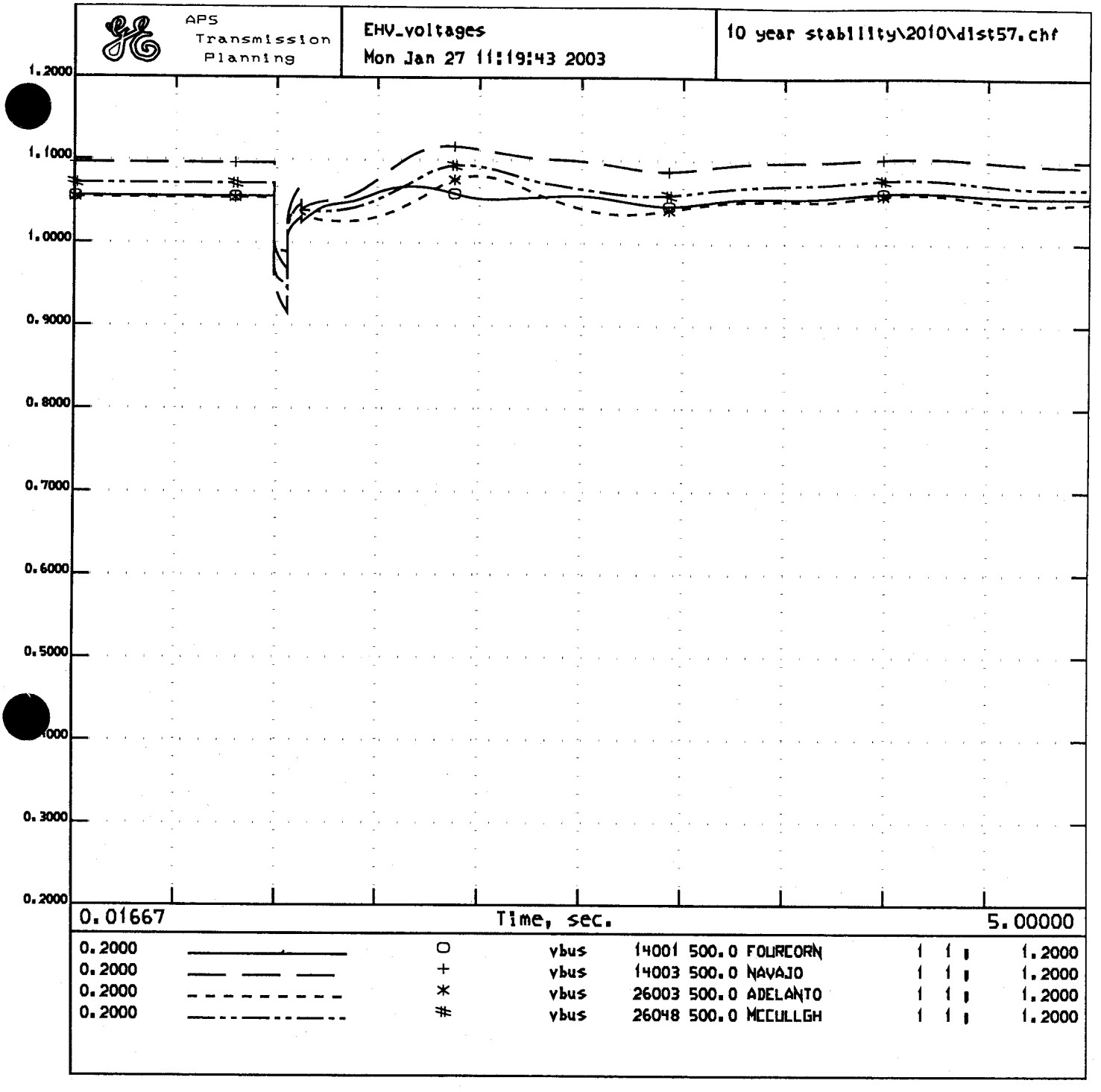
2010 Base Case for ACC 10-YR Stability Runs
PV FLT. w/PV - Devers line out
NOVEMBER 13, 2002
PV-DEV STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-DEV8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



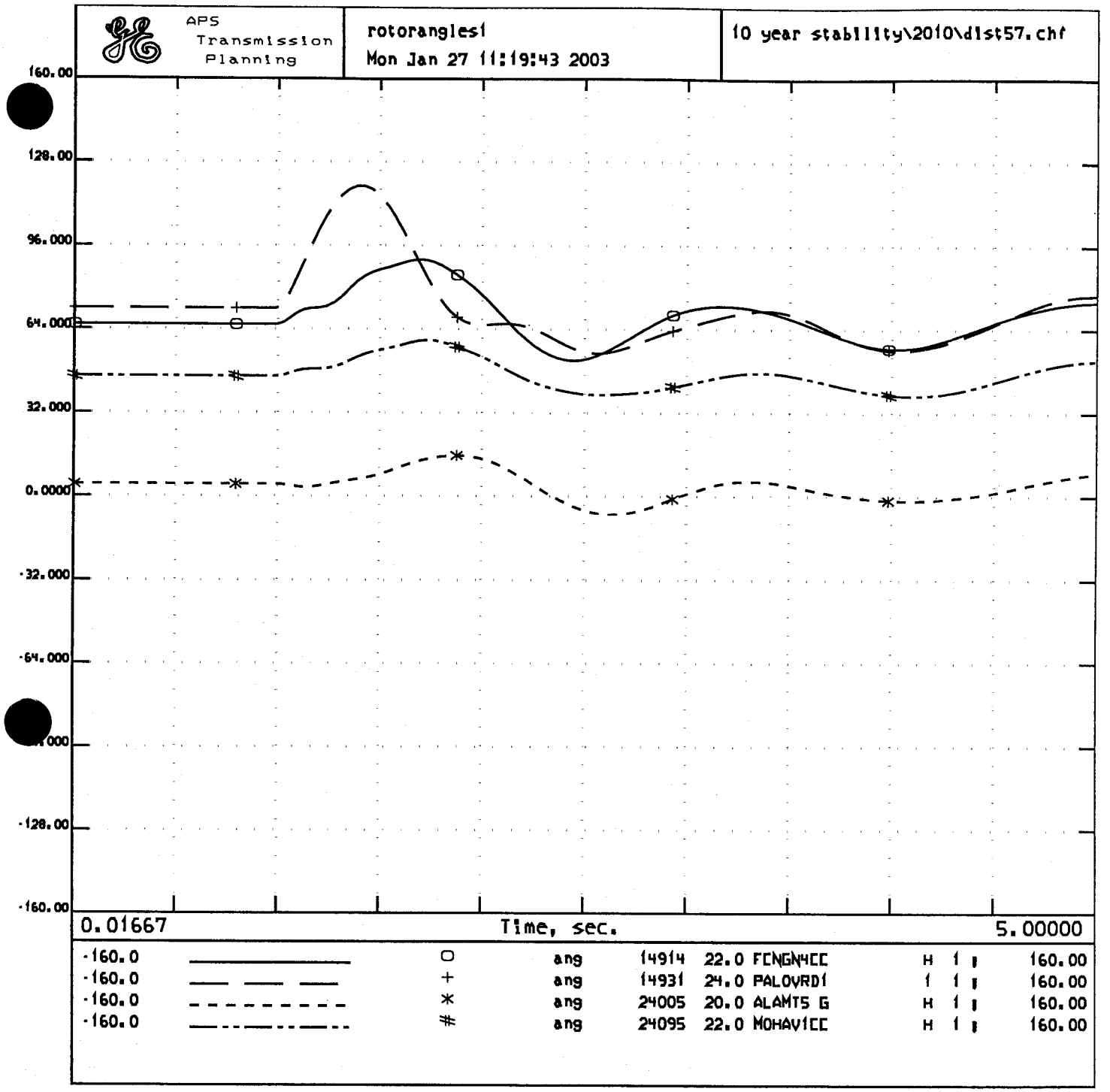
PALO VERDE FLT HASSY-JOJOBA LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
HAS-JJ STAB #1; 01/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/HAS-JJ;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



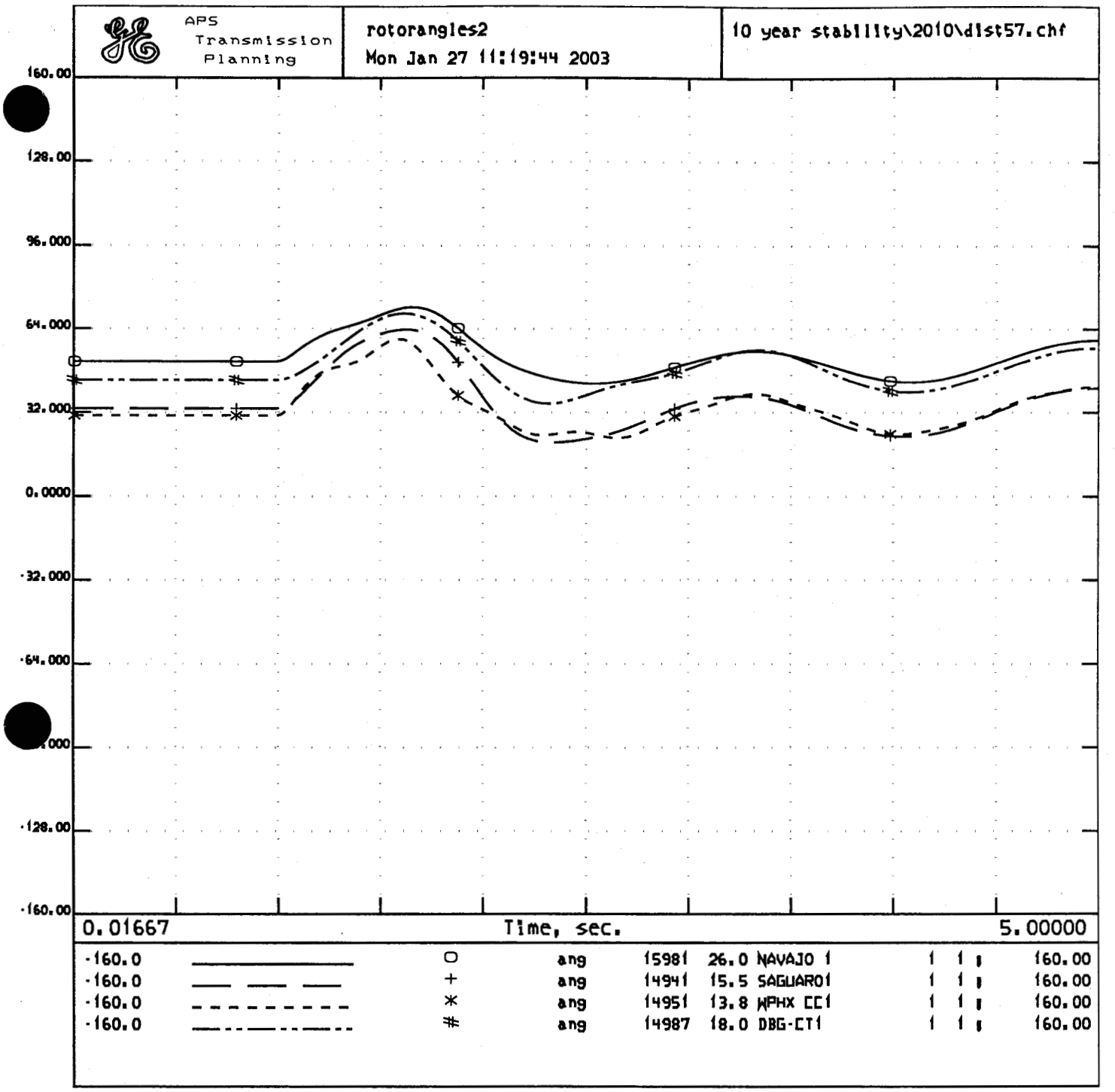
PALO VERDE FLT HASSY-JOJOBA LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
HAS-JJ STAB #1; 01/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/HAS-JJ;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



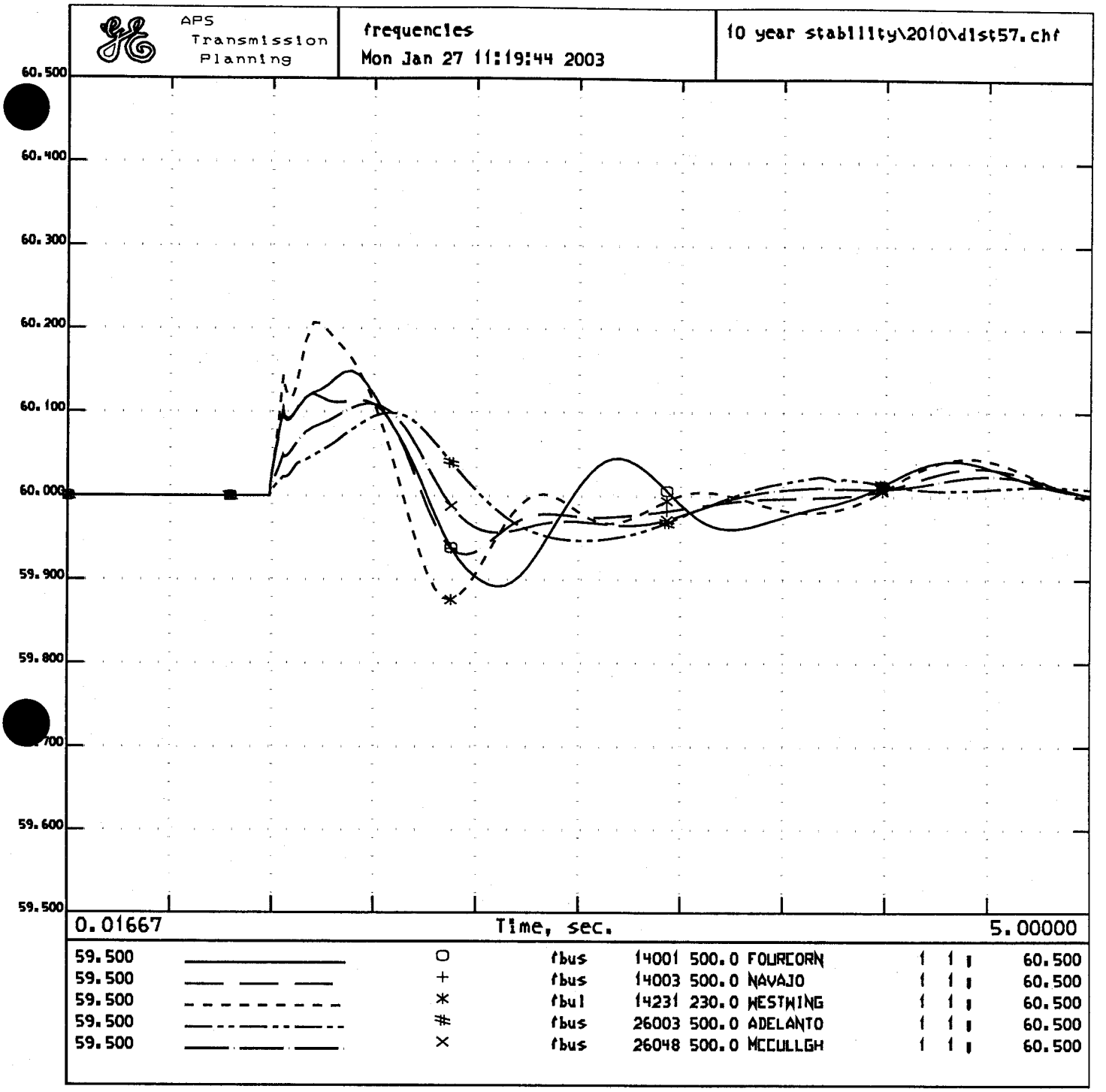
PALO VERDE FLT HASSY-JOJOBA LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
HAS-JJ STAB s1; 01/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/HAS-JJ;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



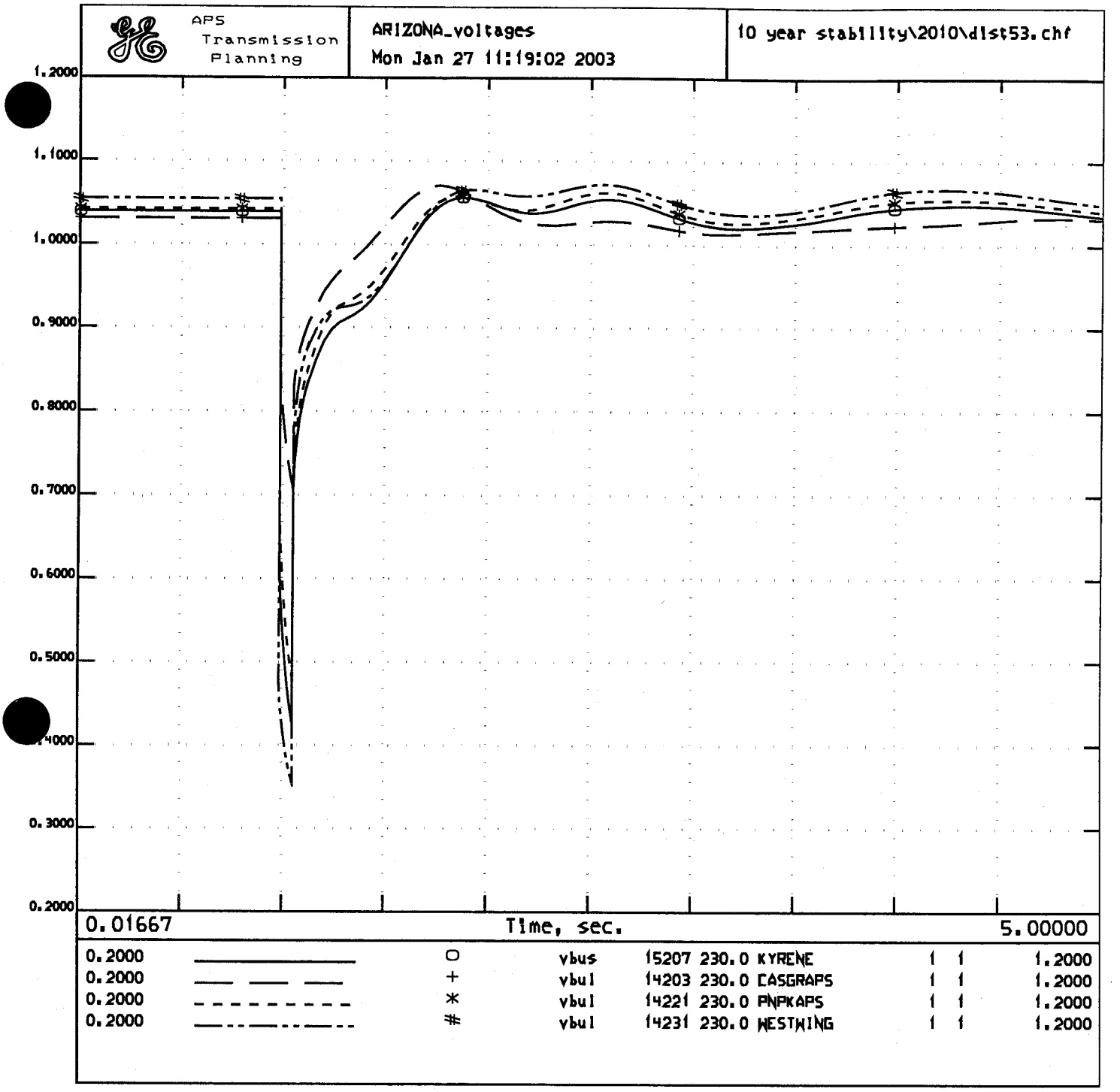
PALO VERDE FLT HASSY-JOJOBA LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
HAS-JJ STAB #1; 01/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/HAS-JJ;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



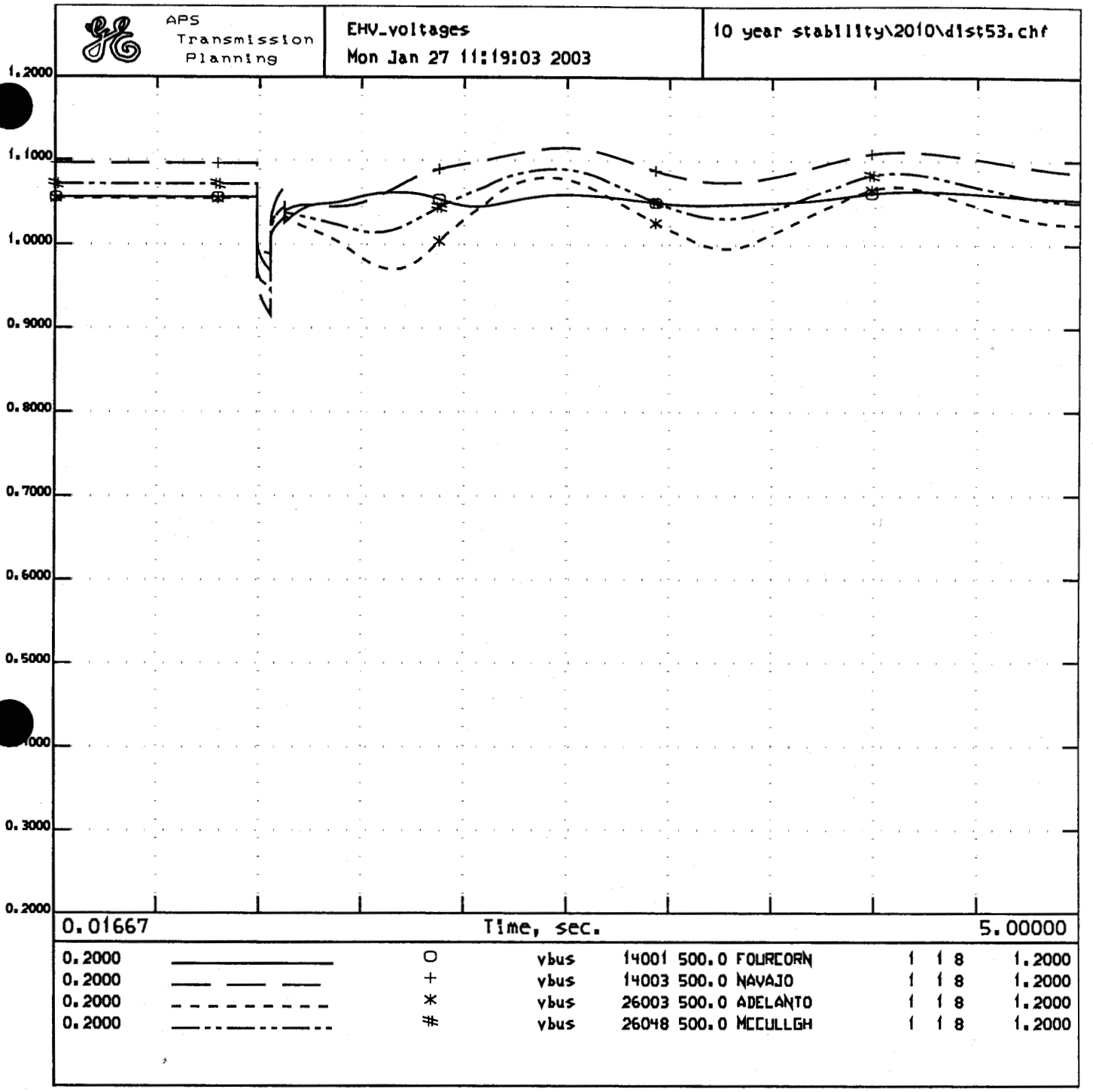
PALO VERDE FLT HASSY-JOJOBA LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
HAS-JJ STAB ;1; 01/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/HAS-JJ;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



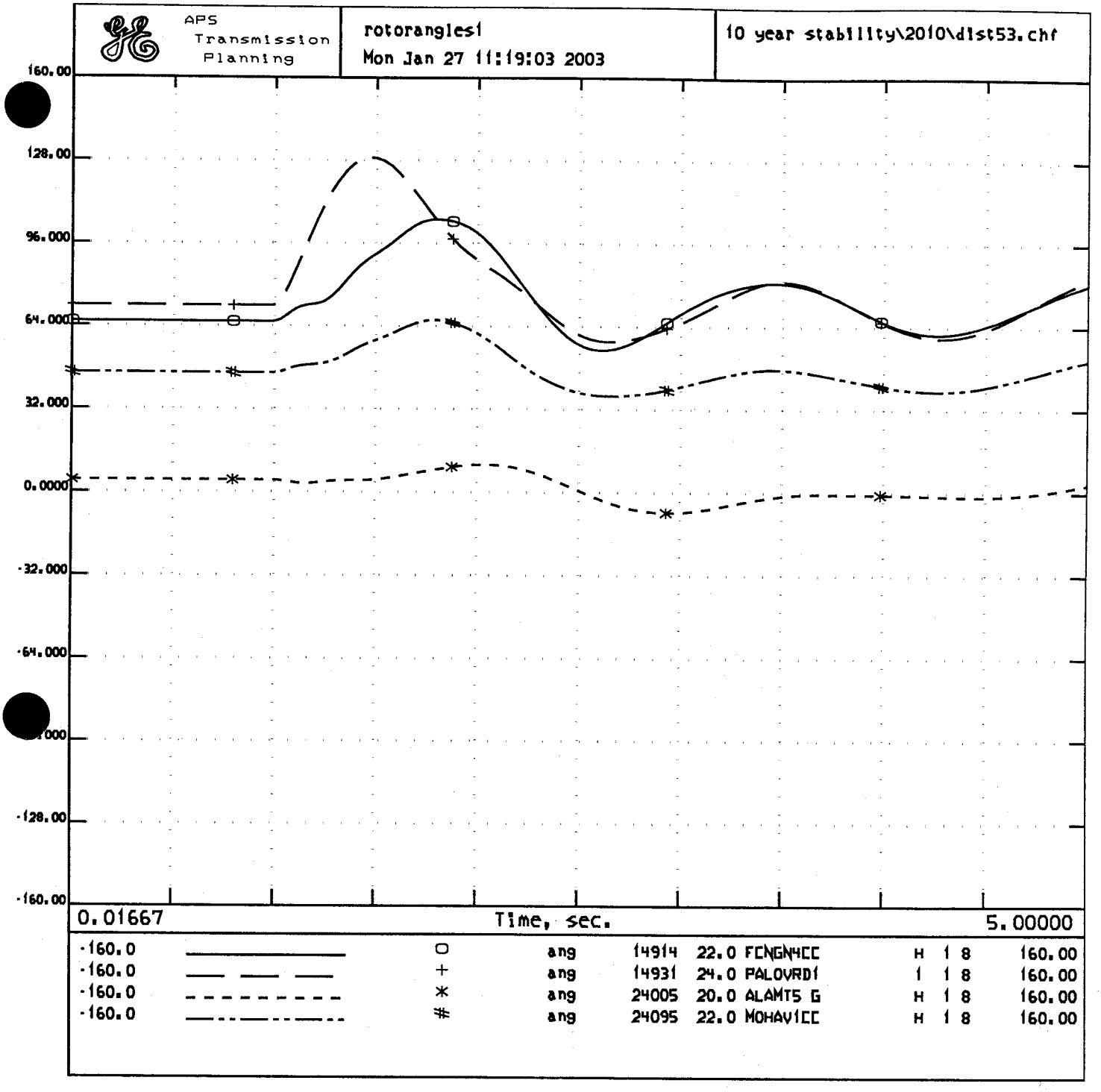
2010 Base Case for ACC 10-YR Stability Runs
PV FLT. w/HASSY-N.GILA line out
NOVEMBER 13, 2002
PV-NGILA STAB; 1/03; T-O 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-NG;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



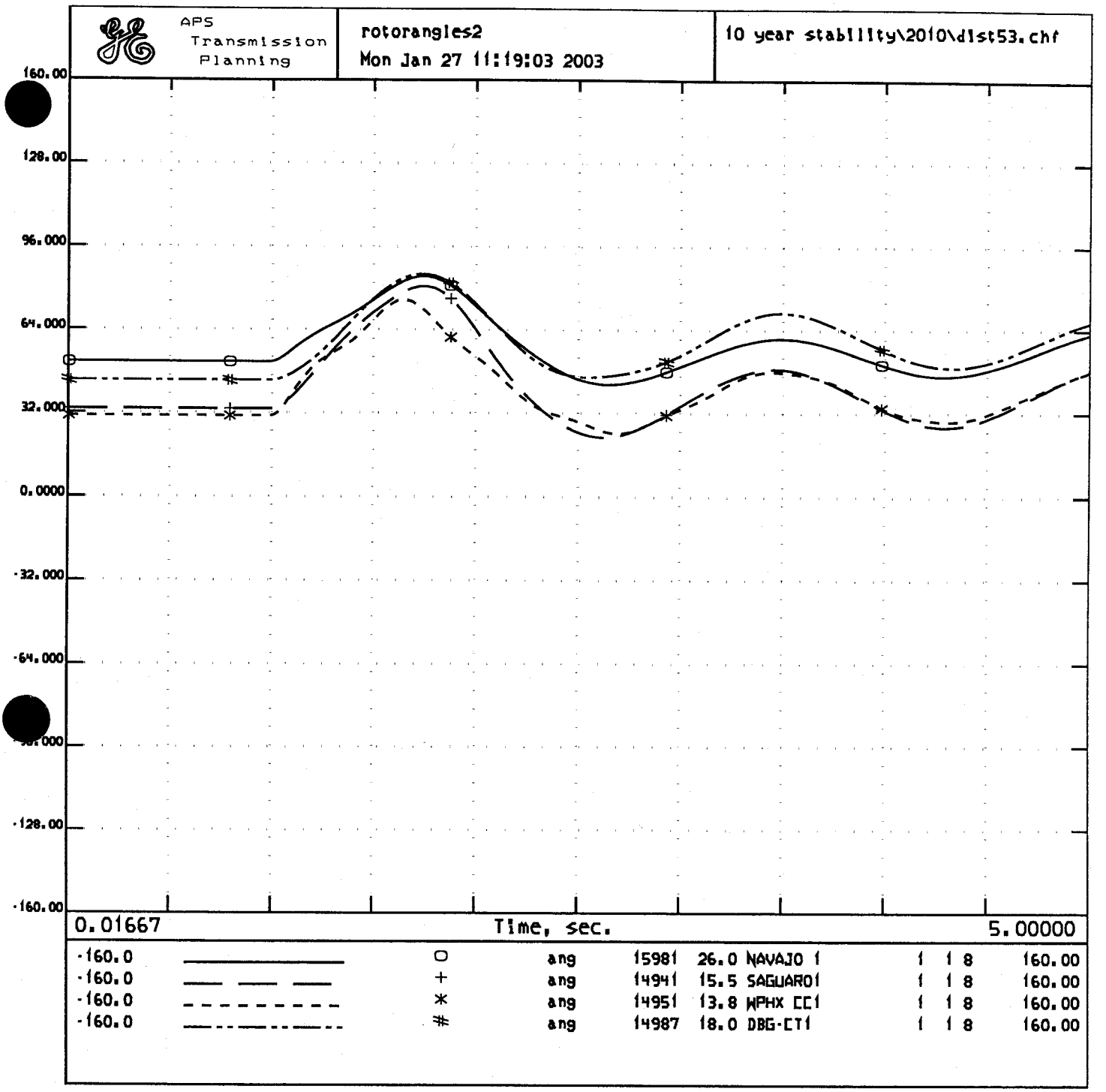
2010 Base Case for ACC 10-YR Stability Runs
PV FLT. w/HASSY-N.GILA line out
NOVEMBER 13, 2002
PV-NGILA STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-NG;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



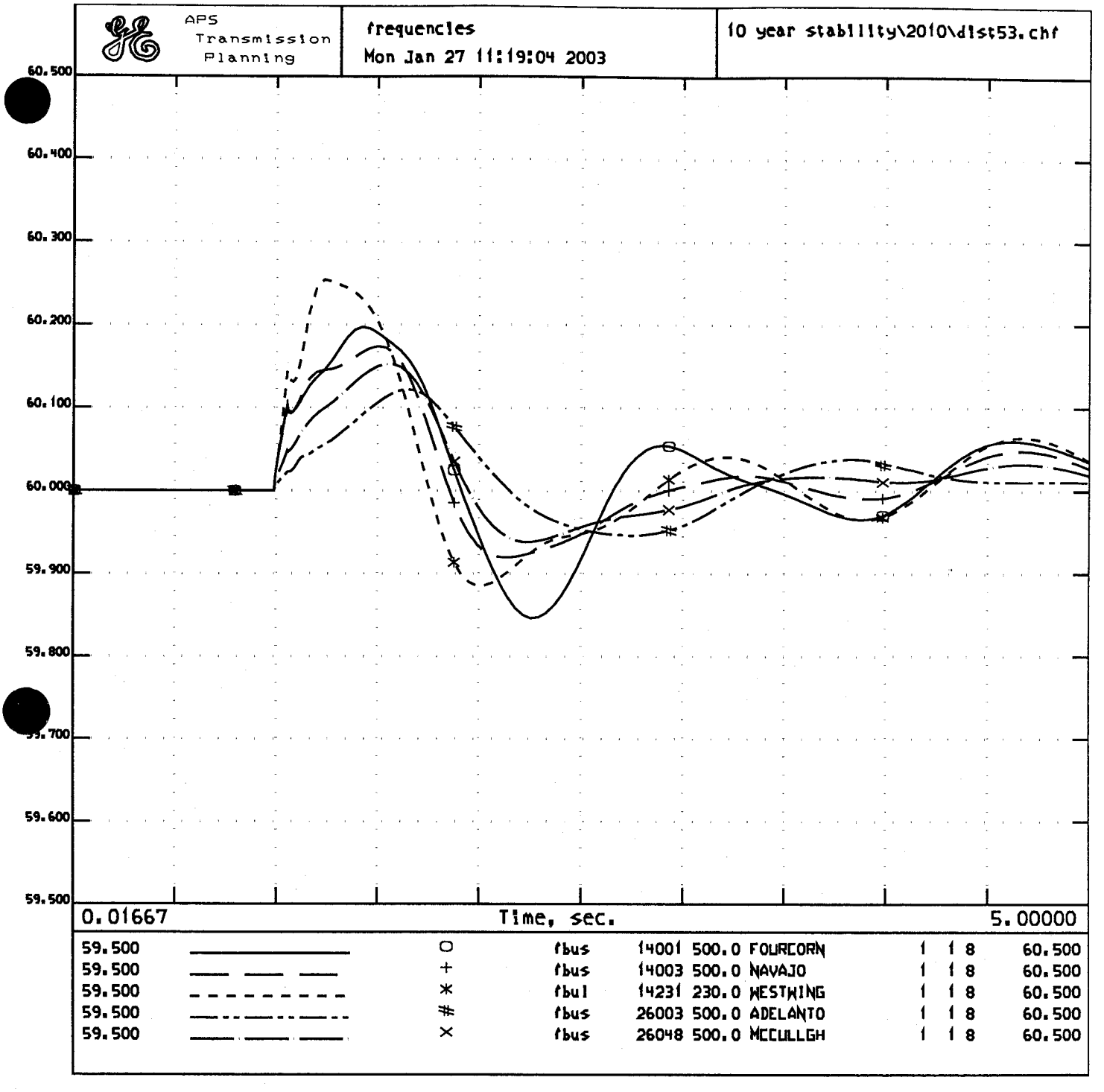
2010 Base Case for ACC 10-YR Stability Runs
PV FLT. w/HASSY-N.GILA line out
NOVEMBER 13, 2002
PV-NGILA STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-NG;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



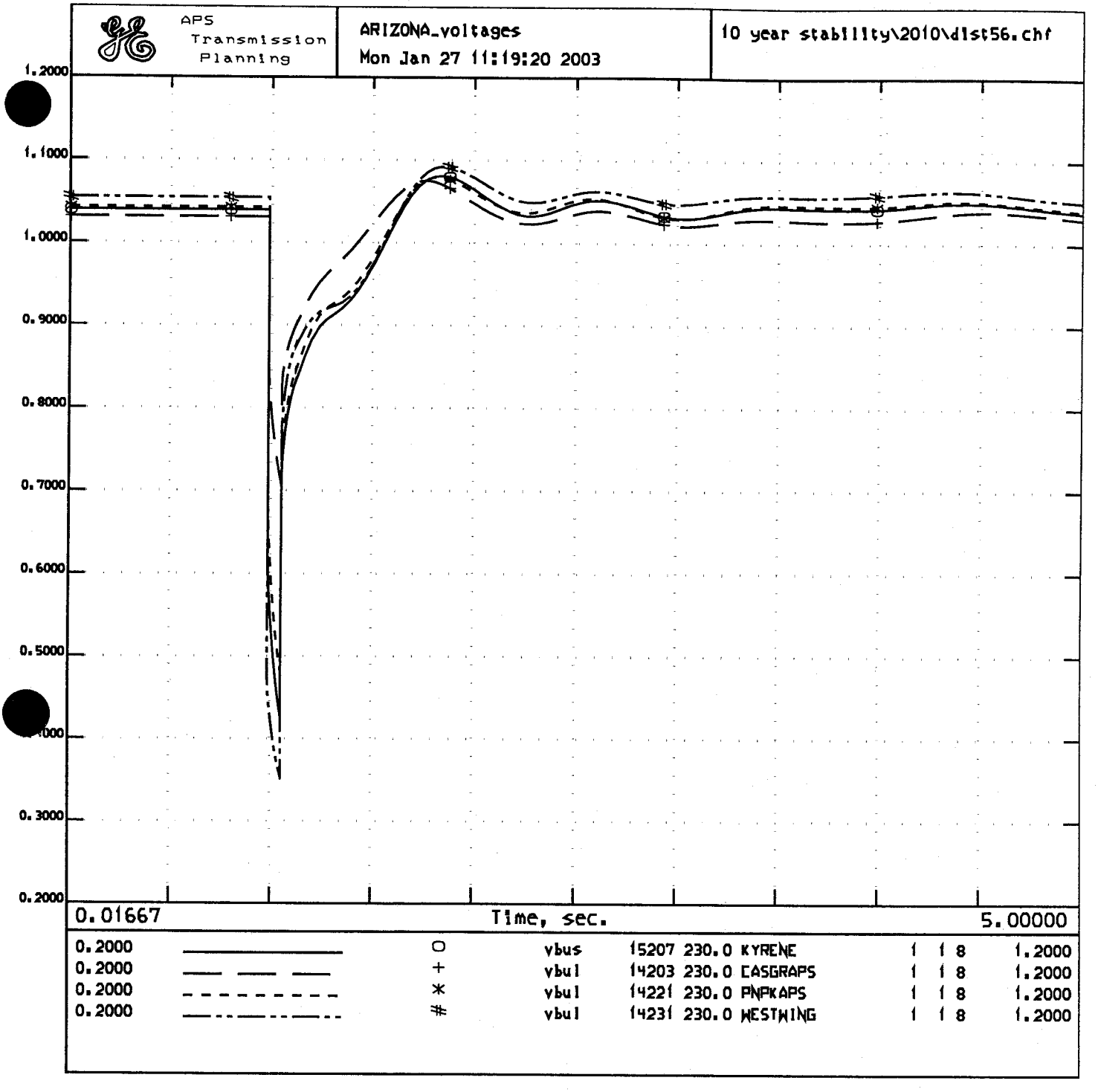
2010 Base Case for ACC 10-YR Stability Runs
PV FLT. w/HASSY-N.GILA line out
NOVEMBER 13, 2002
PV-NGILA STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-NG;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



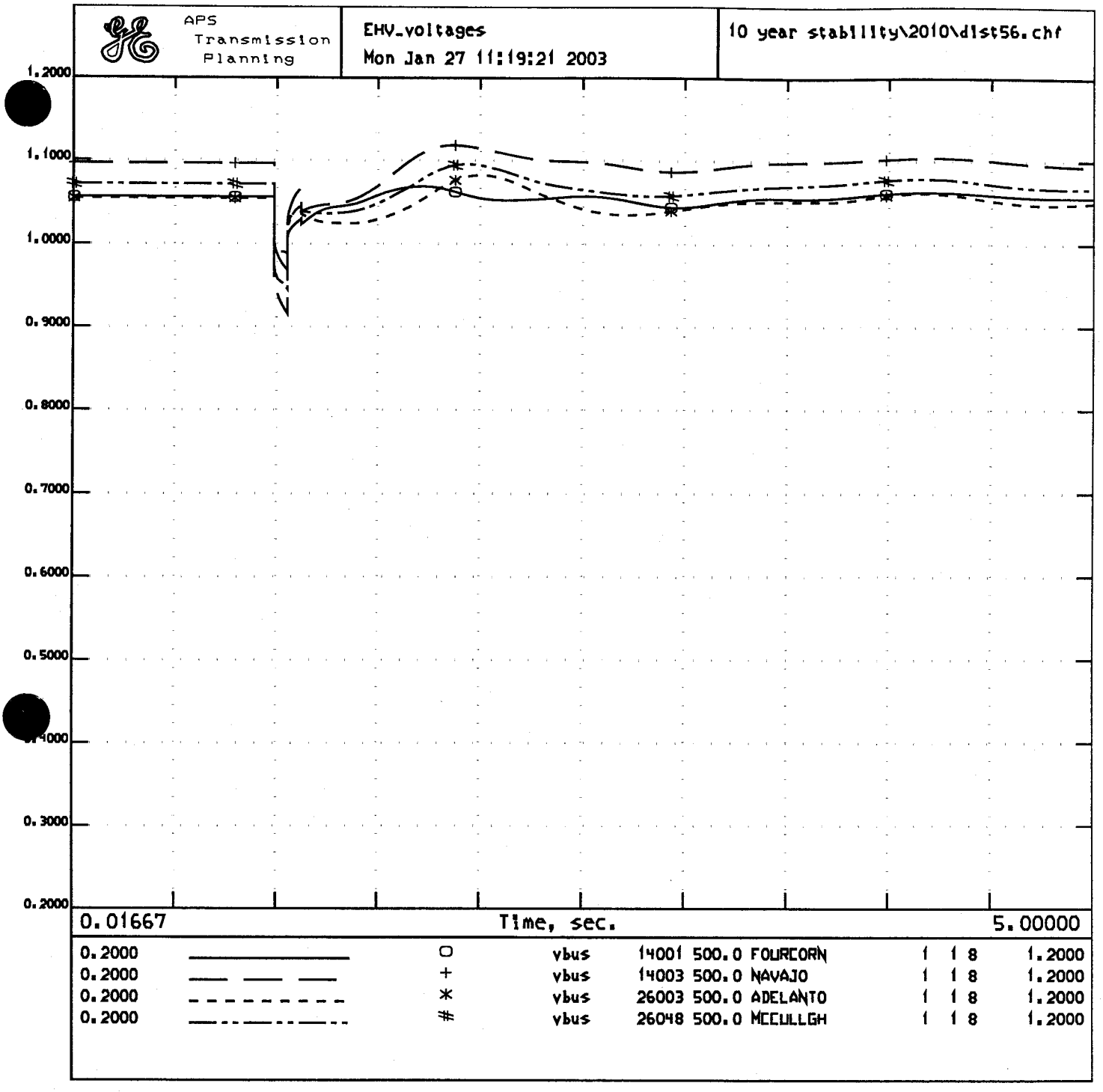
2010 Base Case for ACC 10-YR Stability Runs
PV FLT. w/HASSY-N.GILA line out
NOVEMBER 13, 2002
PV-NGILA STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-NG;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



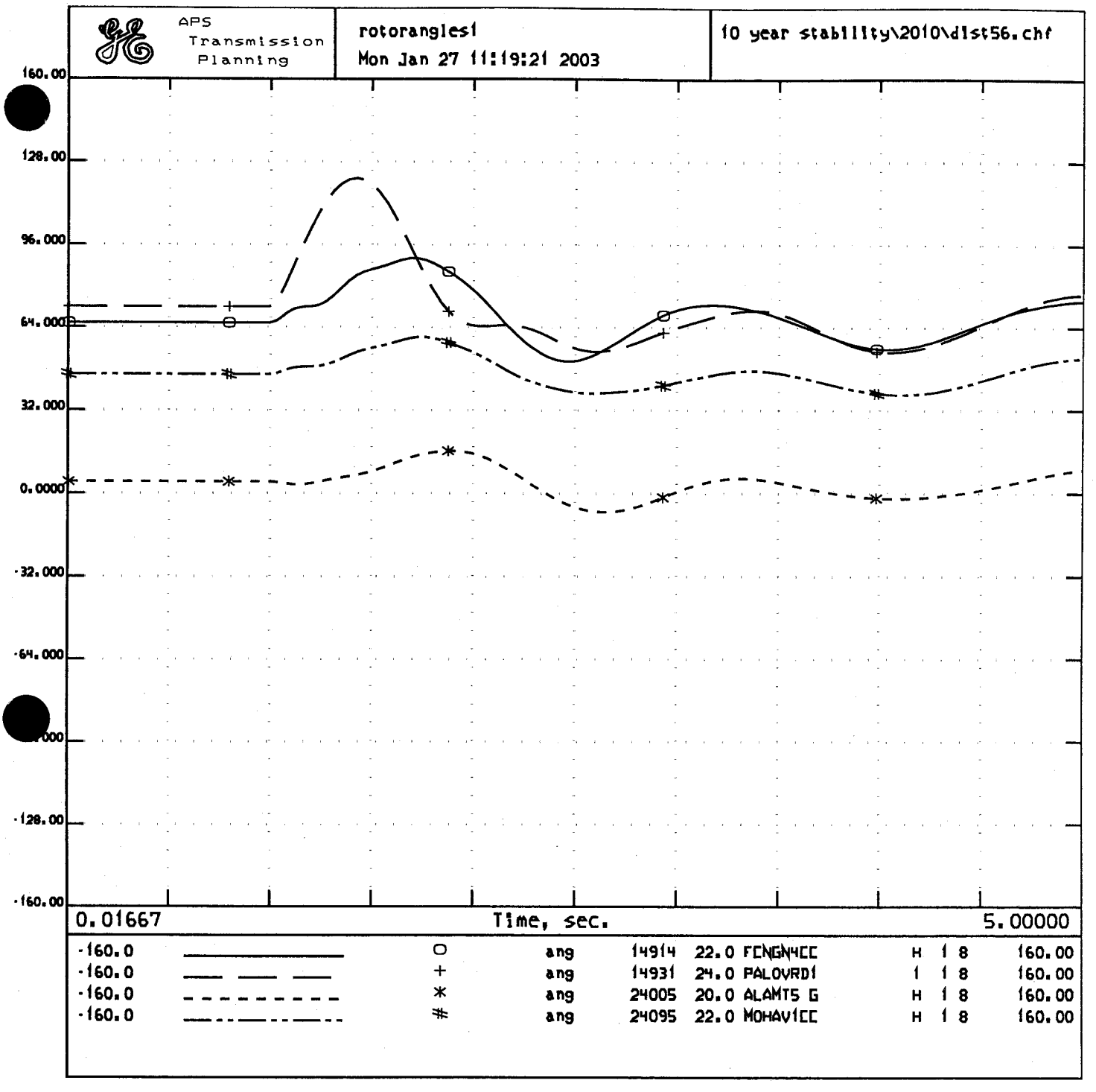
PALO VERDE FLT PV-RUDD LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
PV-RUDD STAB ;1; 01/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-RD;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



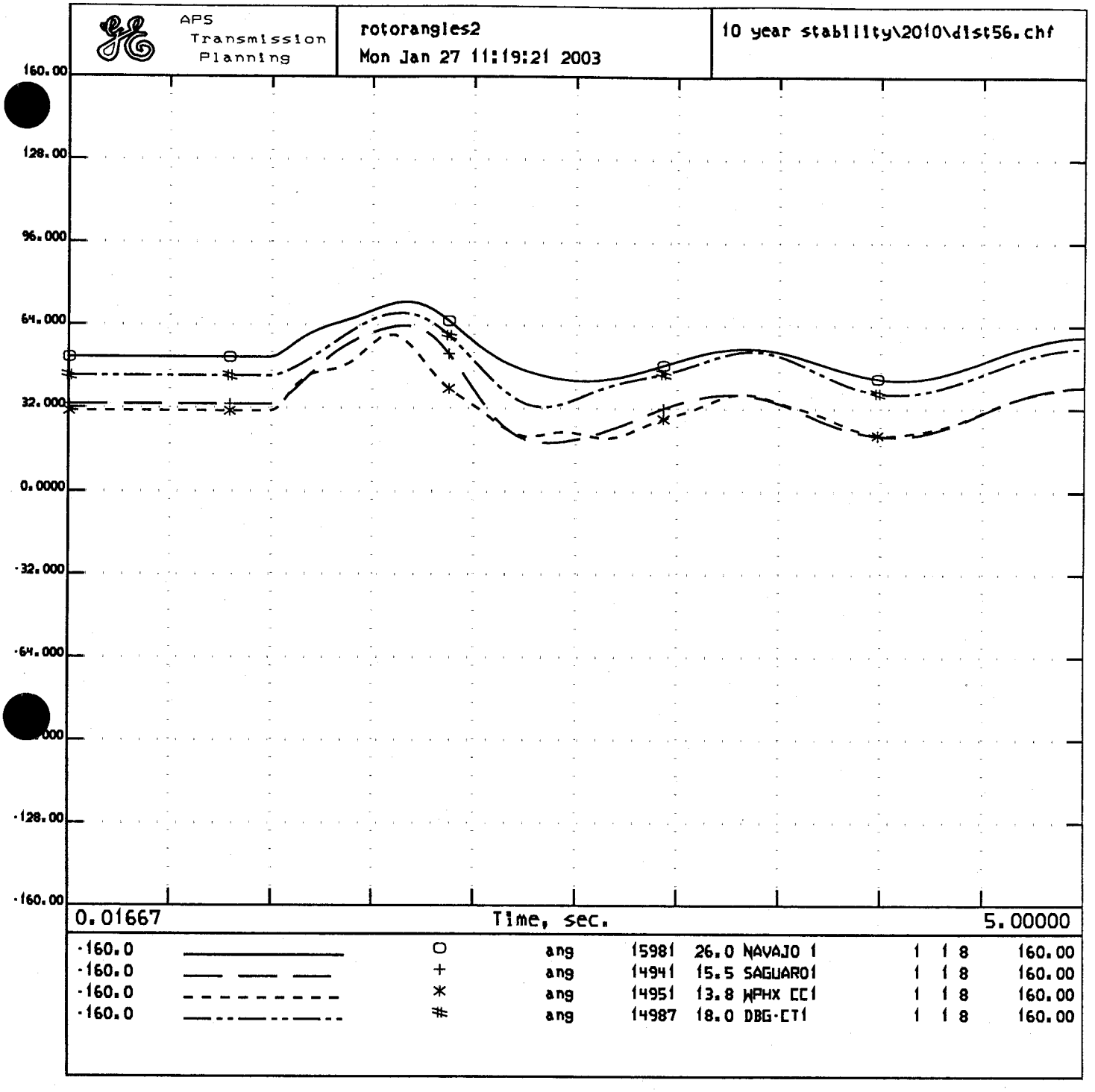
PALO VERDE FLT PV-RUDD LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
PV-RUDD STAB #1; 01/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-RD;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



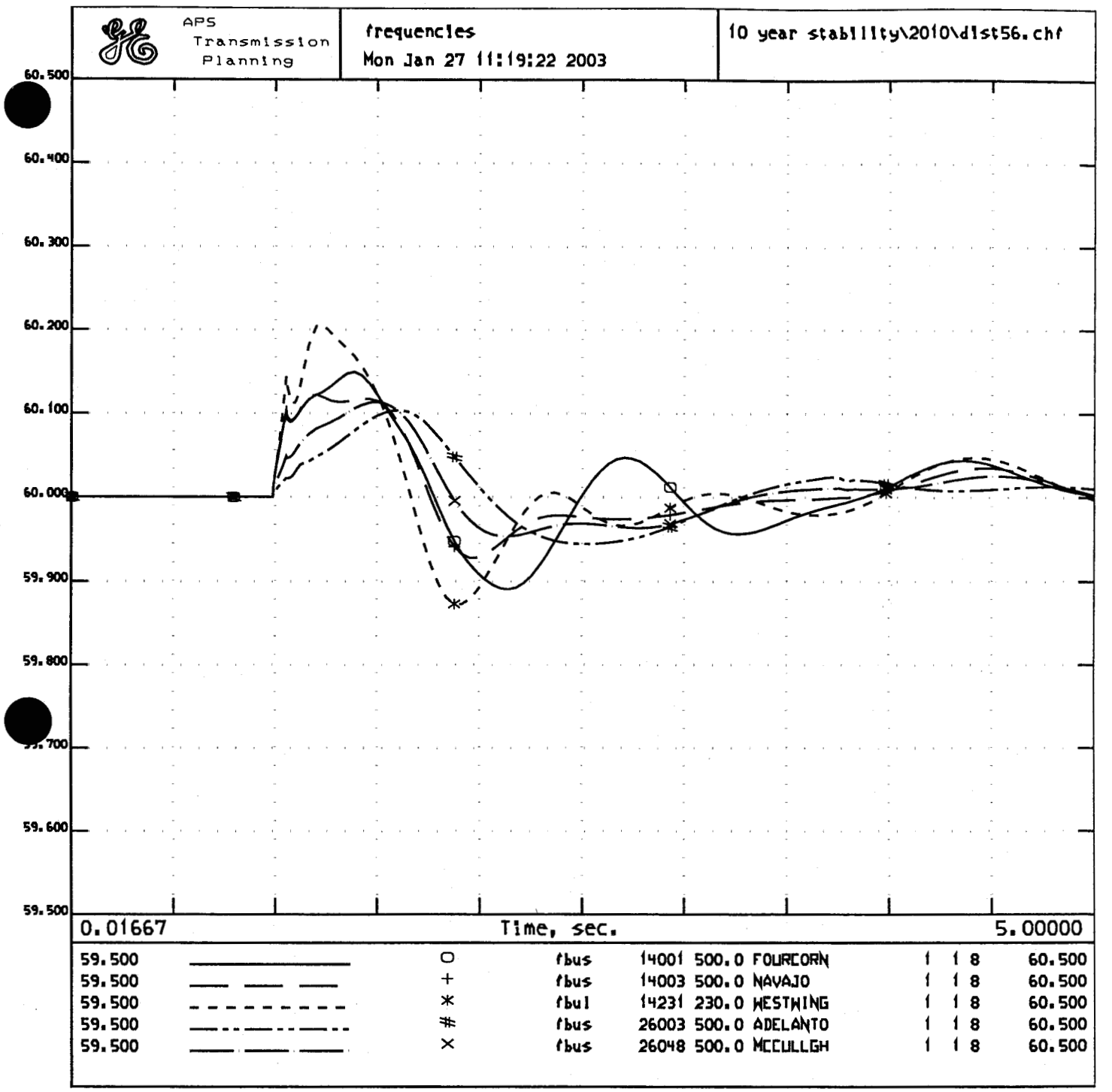
PALO VERDE FLT PV-RUDD LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
PV-RUDD STAB s1; 01/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-RD;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



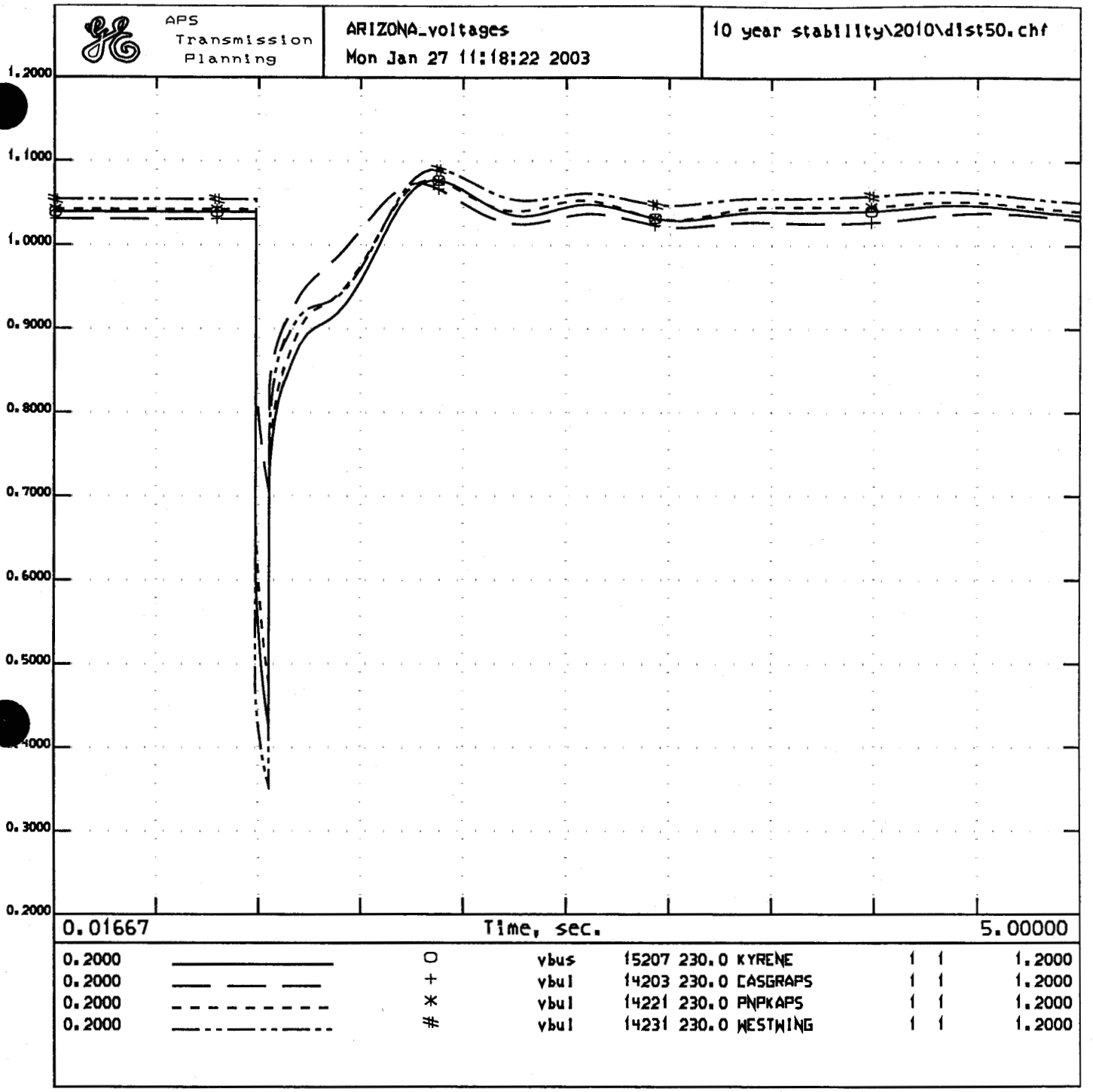
PALO VERDE FLT PV-RUDD LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
PV-RUDD STAB :1; 01/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-RD;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



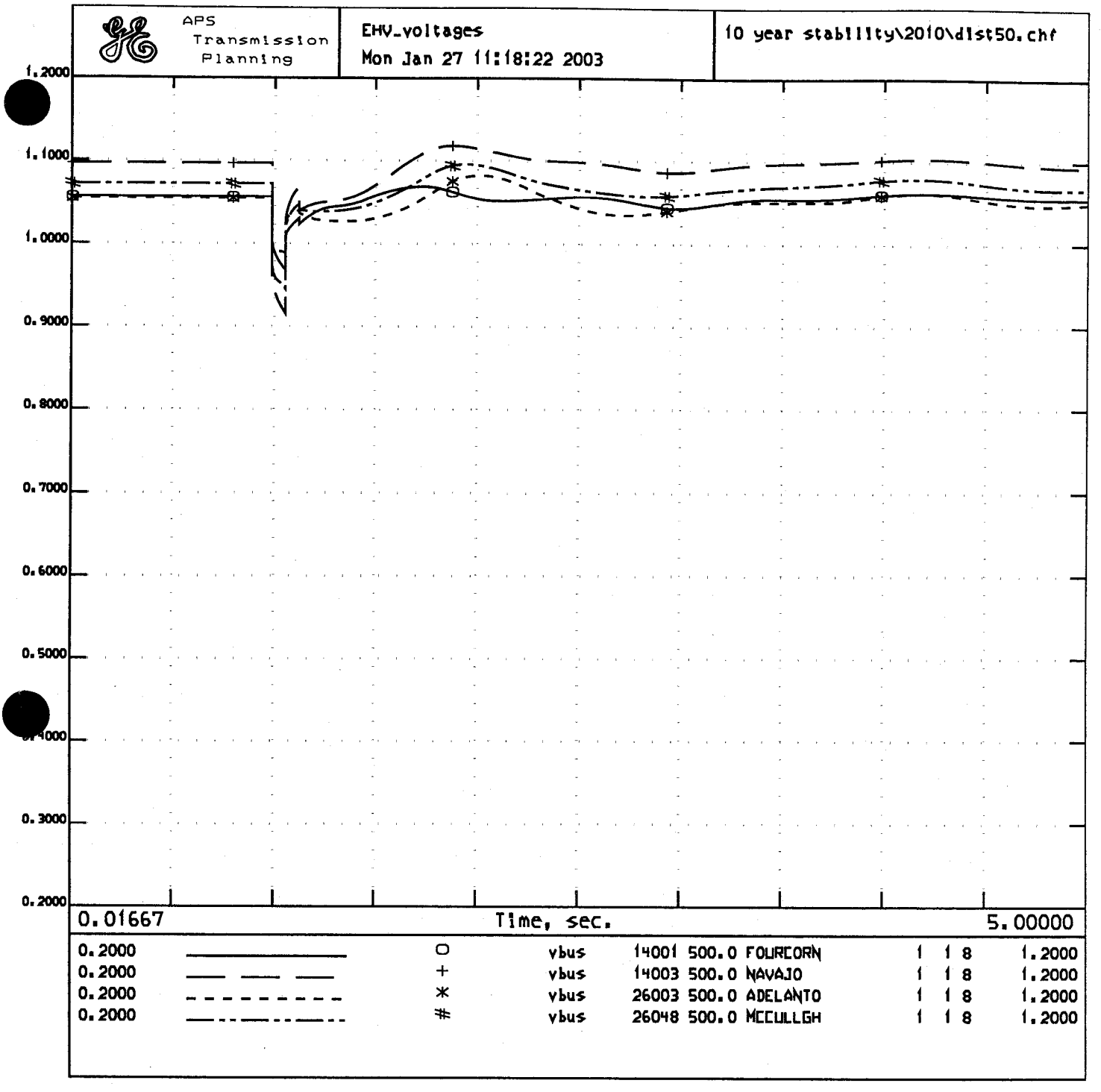
PALO VERDE FLT PV-RUDD LINE OUT
Originally the 2007 HSIA APPROVED BASE CASE
NOVEMBER 13, 2002
PV-RUDD STAB ;1; 01/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-RD;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



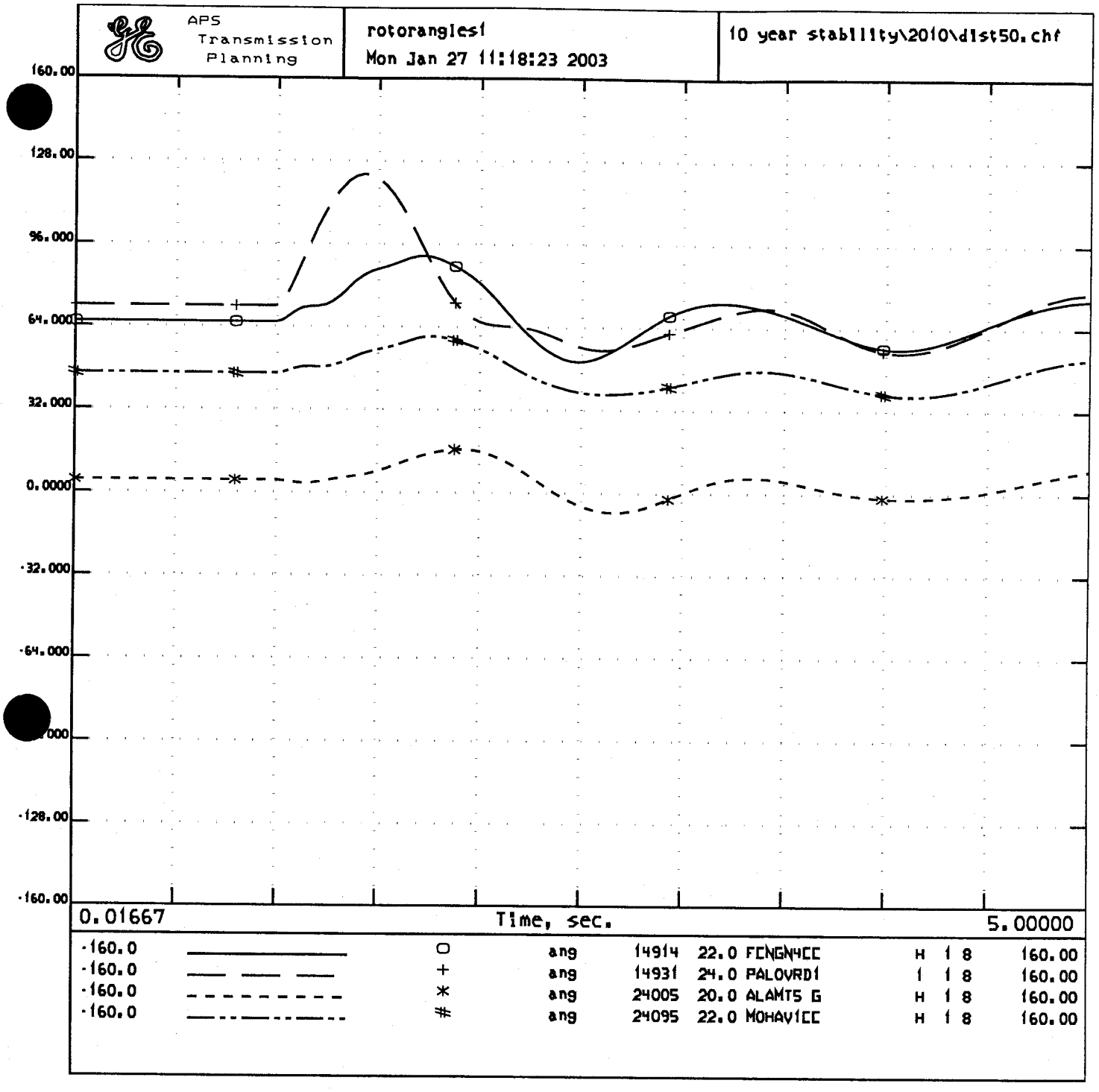
2010 Base Case for ACC 10-YR Stability Runs
PV FLT w/PV-WW line out
NOVEMBER 13, 2002
PV-WWG STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-WW;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



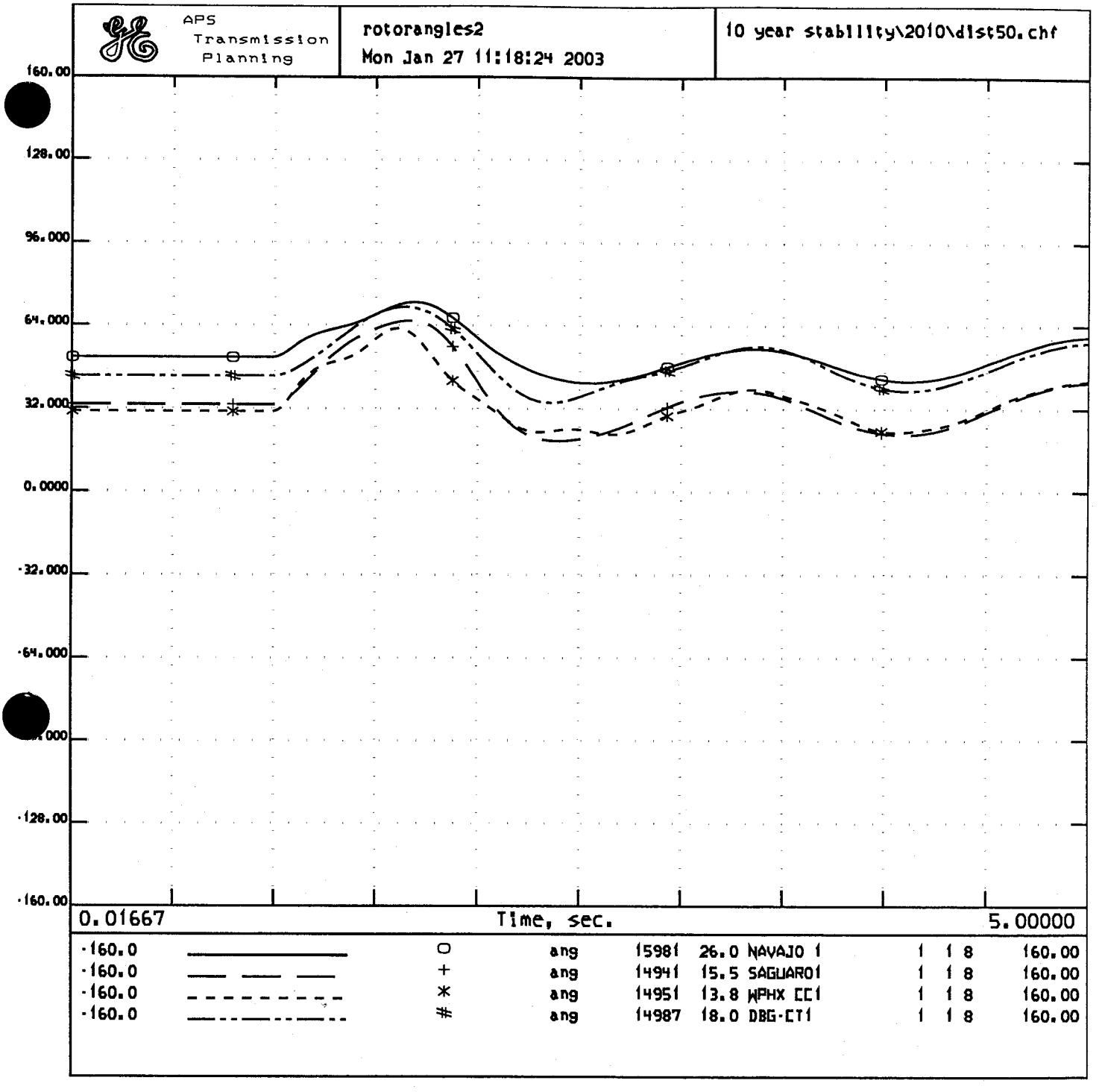
2010 Base Case for ACC 10-YR Stability Runs
PV FLT w/PV-WW line out
NOVEMBER 13, 2002
PV-WWG STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-WW;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



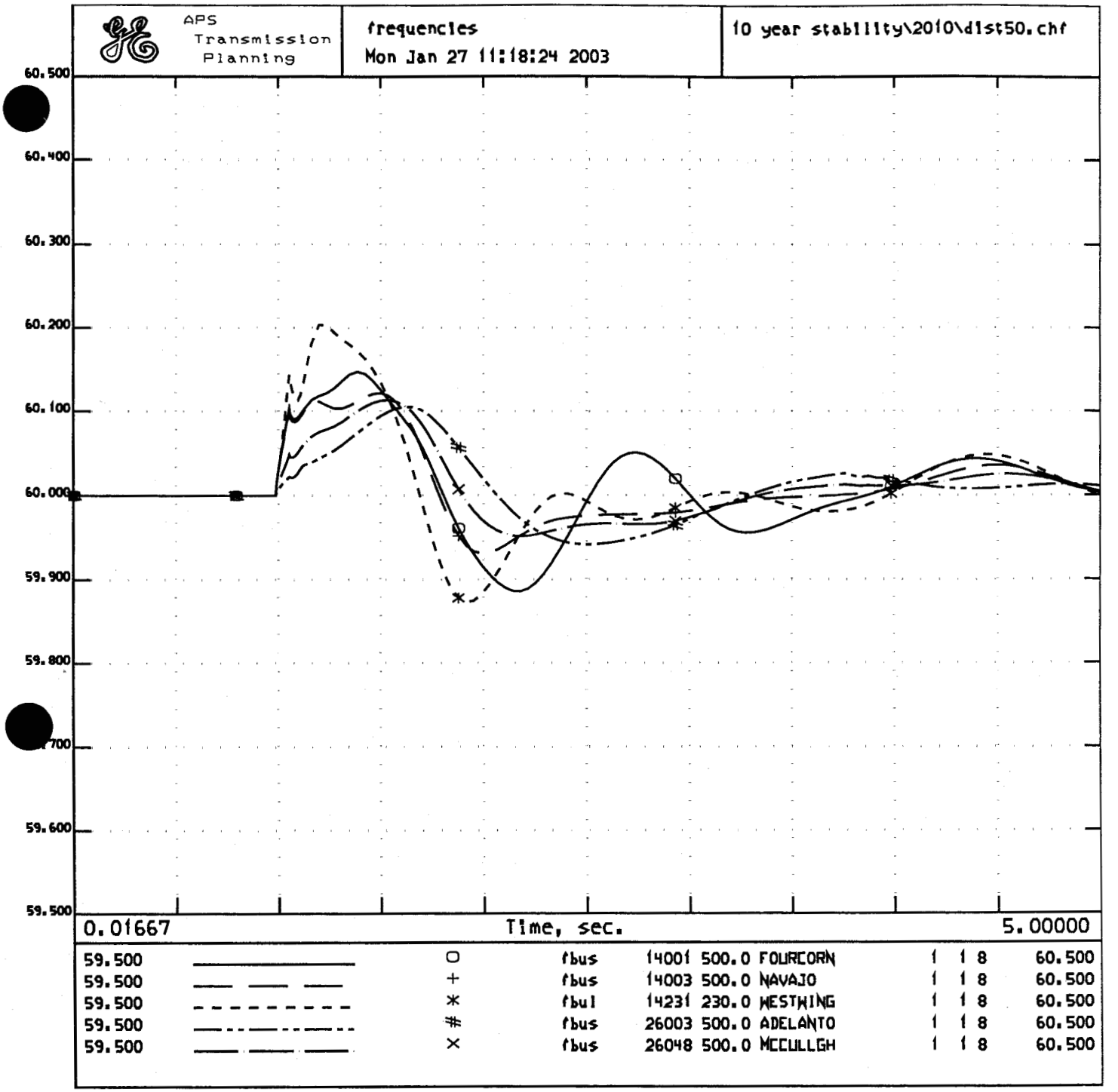
2010 Base Case for ACC 10-YR Stability Runs
PV FLT w/PV-WW line out
NOVEMBER 13, 2002
PV-WWG STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-WW;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



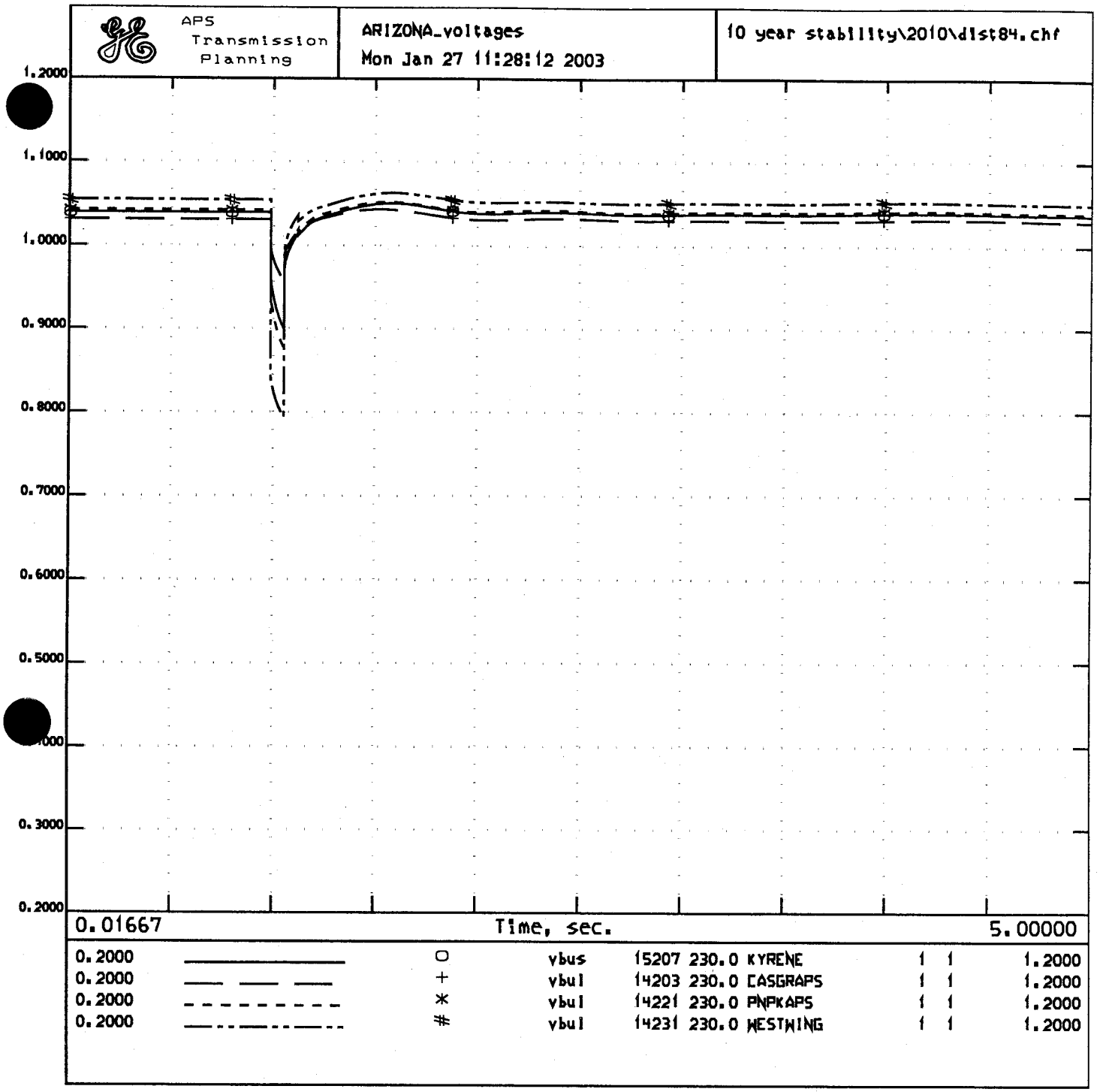
2010 Base Case for ACC 10-YR Stability Runs
PV FLT w/PV-WW line out
NOVEMBER 13, 2002
PV-WWG STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-WW;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



2010 Base Case for ACC 10-YR Stability Runs
PV FLT w/PV-WW line out
NOVEMBER 13, 2002
PV-WWG STAB; 1/03; T=0 3P FLT PV500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-WW;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



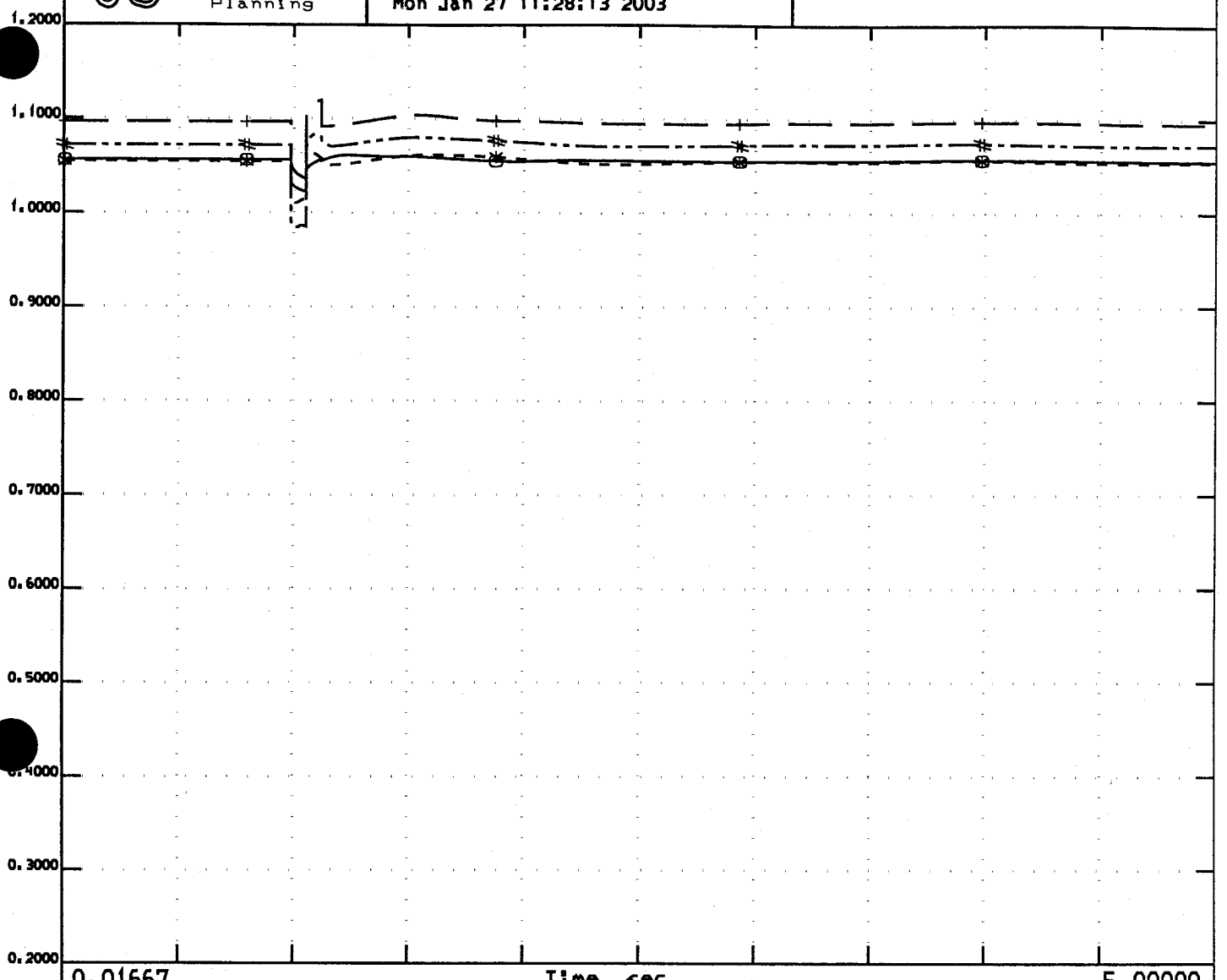
PERKINS FLT PERKINS-MEAD LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
PERK-MEAD STAB; 01/03; T=0 3P FLT PERK500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MKP/WWG;4C CLR FLT W/PERK-MEAD;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.

APS Transmission Planning

EHV_voltages
Mon Jan 27 11:28:13 2003

10 year stability\2010\dist84.chf

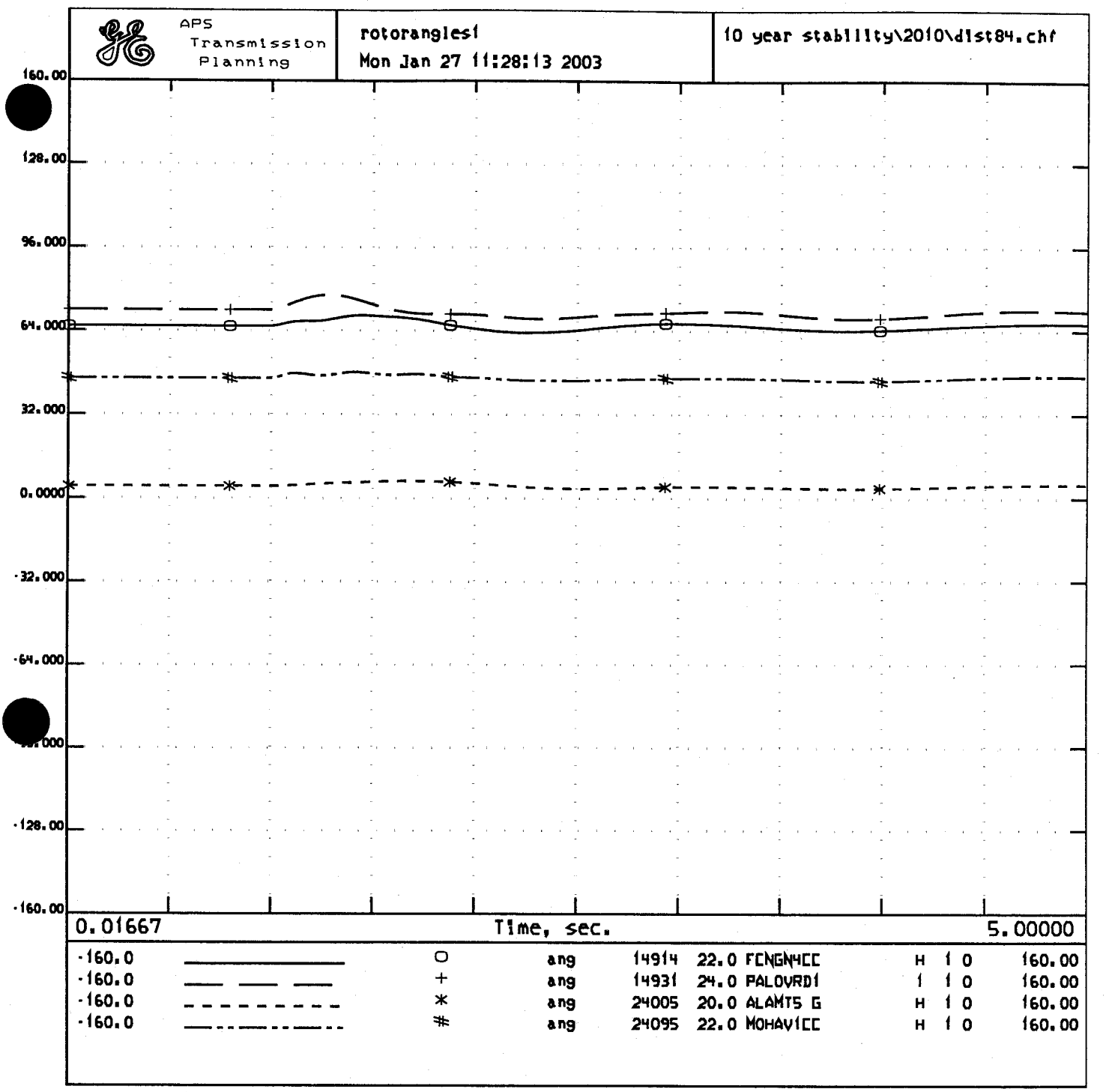


0.01667 Time, sec. 5.00000

0.2000	————	O	vbus	14001	500.0	FOURCORN	1 1 0	1.2000
0.2000	— — —	+	vbus	14003	500.0	NAVAJO	1 1 0	1.2000
0.2000	- - - - - - - - -	*	vbus	26003	500.0	ADELANTO	1 1 0	1.2000
0.2000	—··—··—··—	#	vbus	26048	500.0	MCCULLGH	1 1 0	1.2000

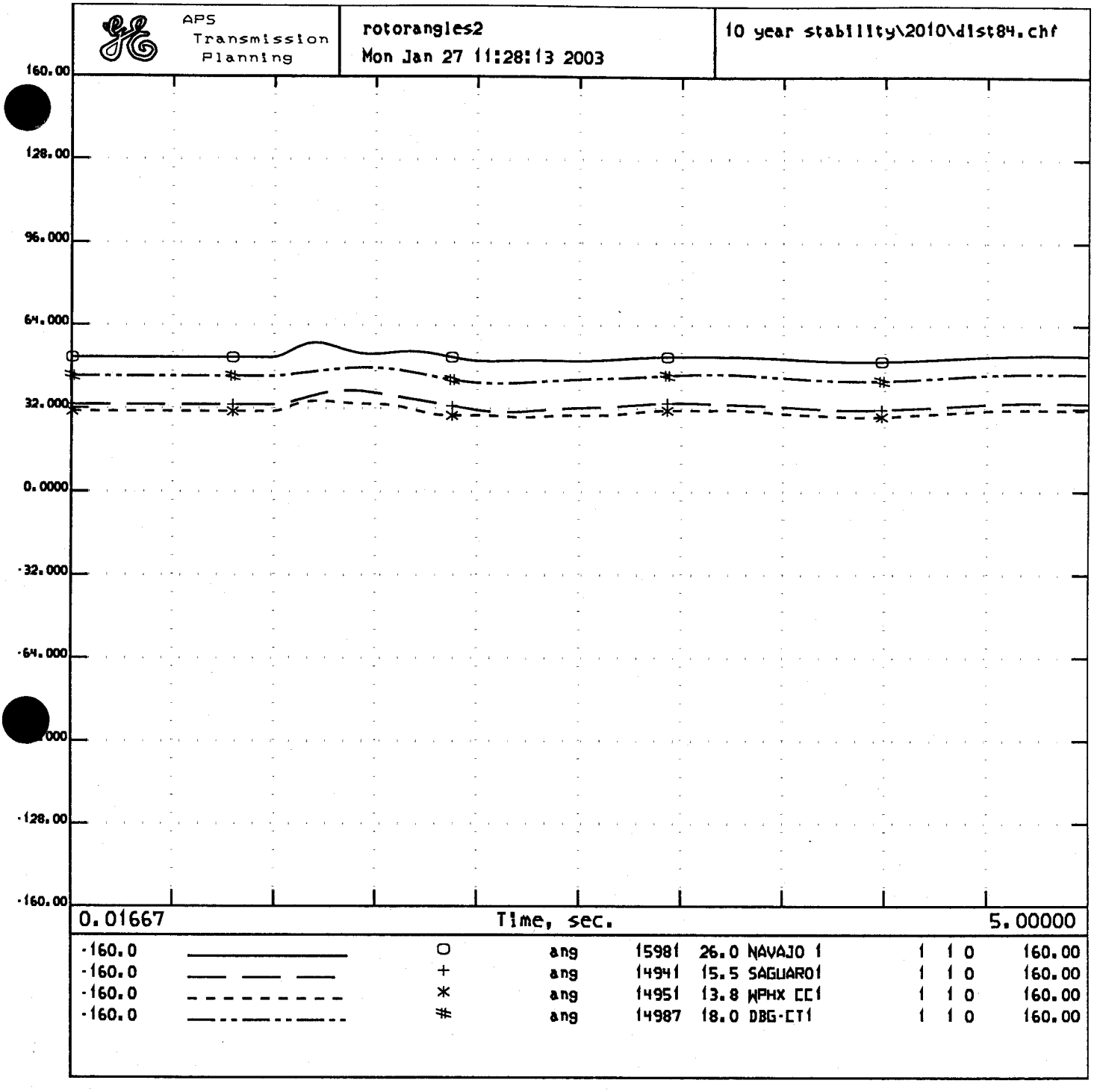
PERKINS FLT PERKINS-MEAD LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
PERK-MEAD STAB; 01/03; T=0 3P FLT PERK500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MKP/WWG;4C CLR FLT W/PERK-MEAD;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



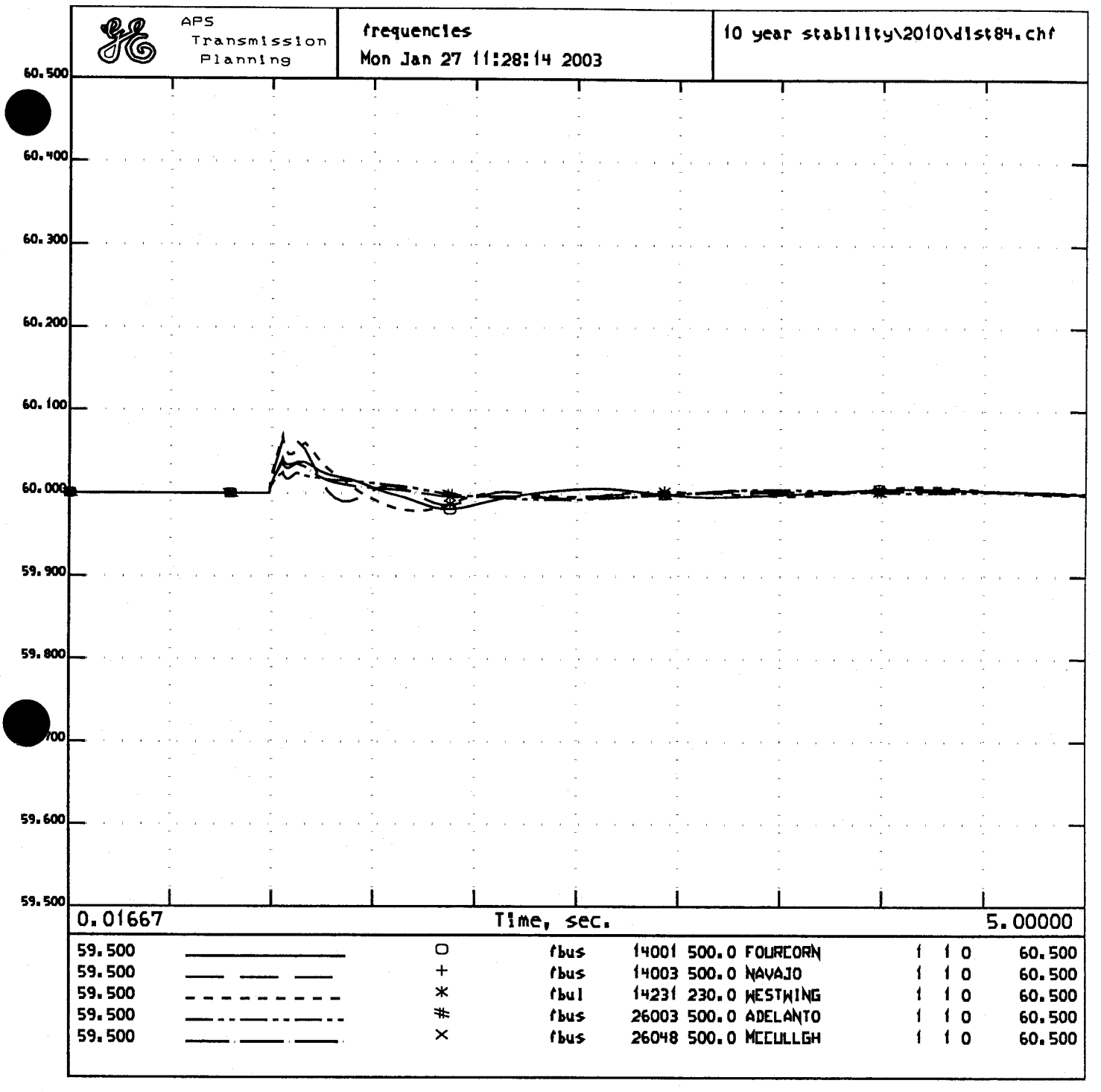
PERKINS FLT PERKINS-MEAD LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
PERK-MEAD STAB; 01/03; T=0 3P FLT PERK500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MKP/WWG;4C CLR FLT W/PERK-MEAD;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



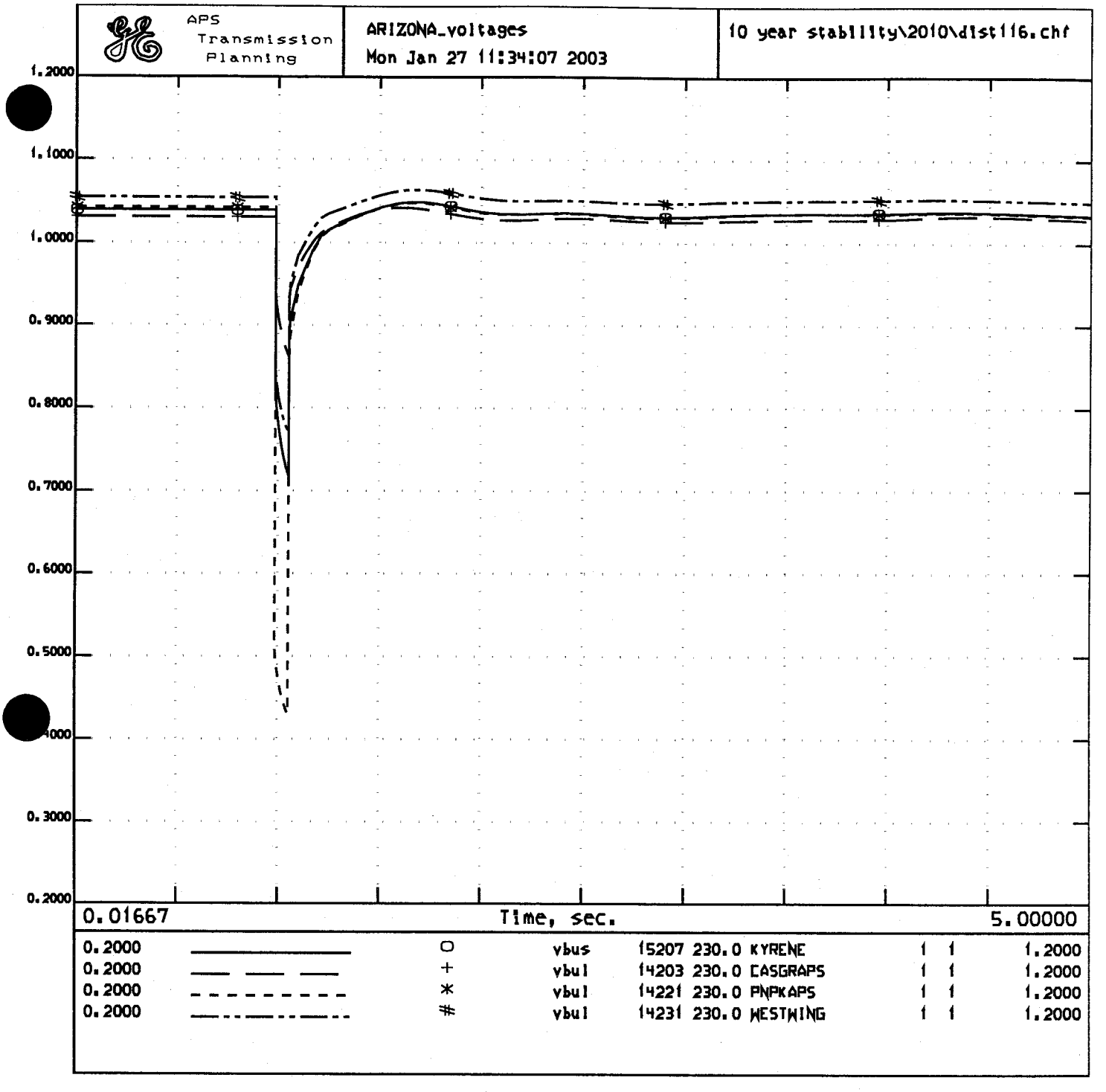
PERKINS FLT PERKINS-MEAD LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
PERK-MEAD STAB; 01/03; T=0 3P FLT PERK500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MKP/WWG;4C CLR FLT W/PERK-MEAD;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



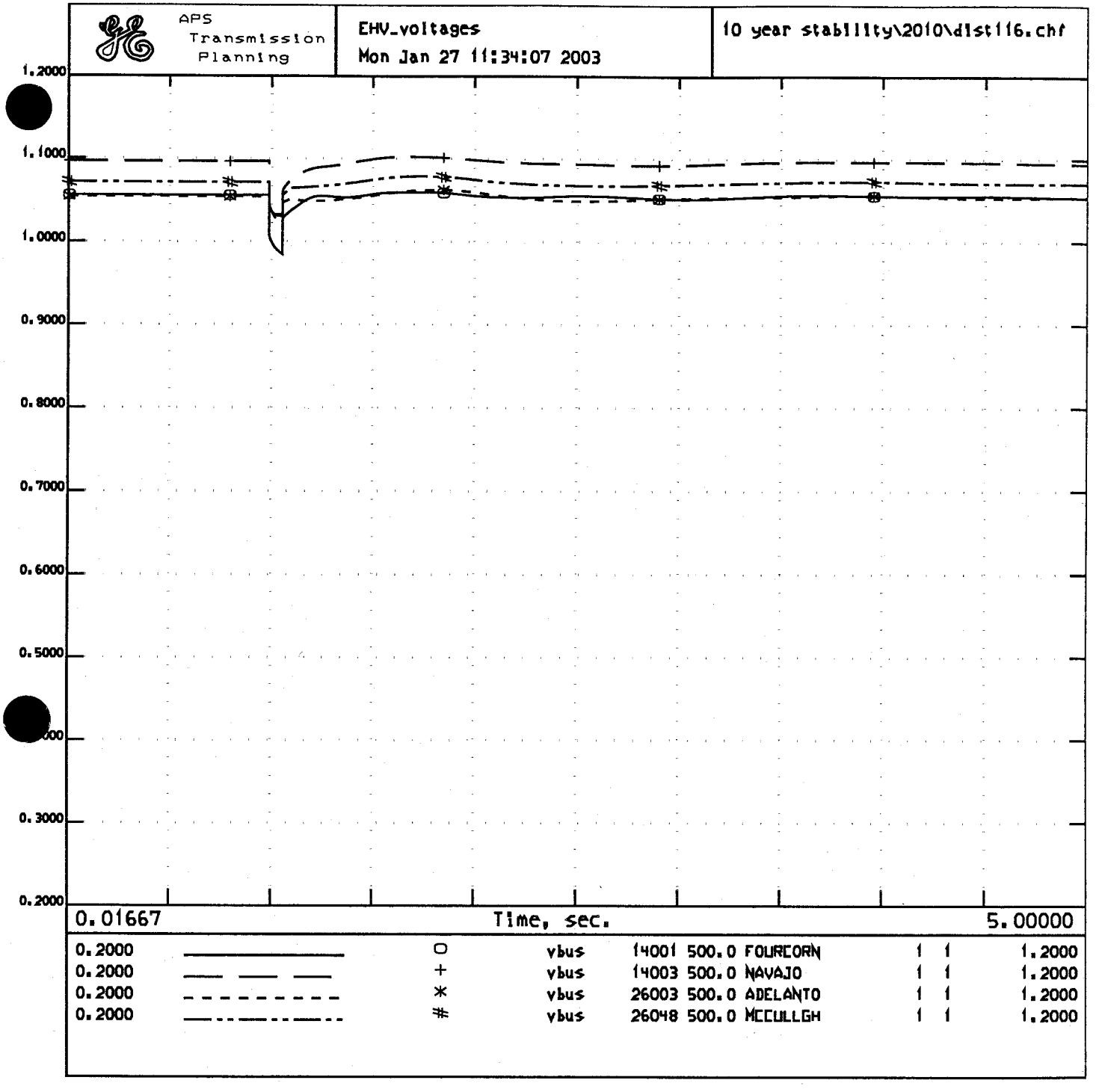
PERKINS FLT PERKINS-MEAD LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
PERK-MEAD STAB; 01/03; T=0 3P FLT PERK500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MKP/WWG;4C CLR FLT W/PERK-MEAD;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



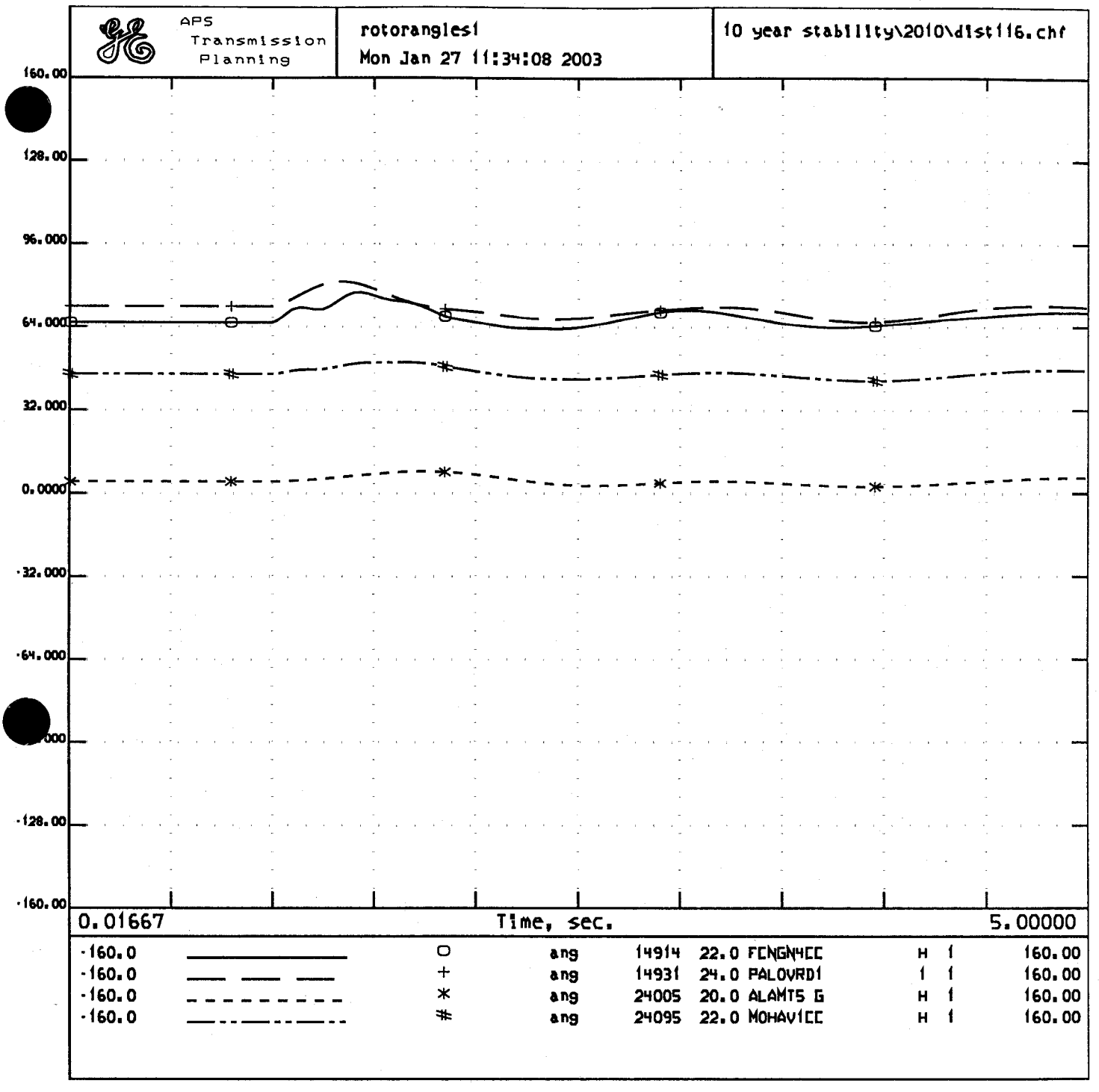
PNPK 345KV FLT PP-CH LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
PP-CH STAB :1; 01/03; T=0 3P FLT PP345;
4C CLR FLT W/PP-CH;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



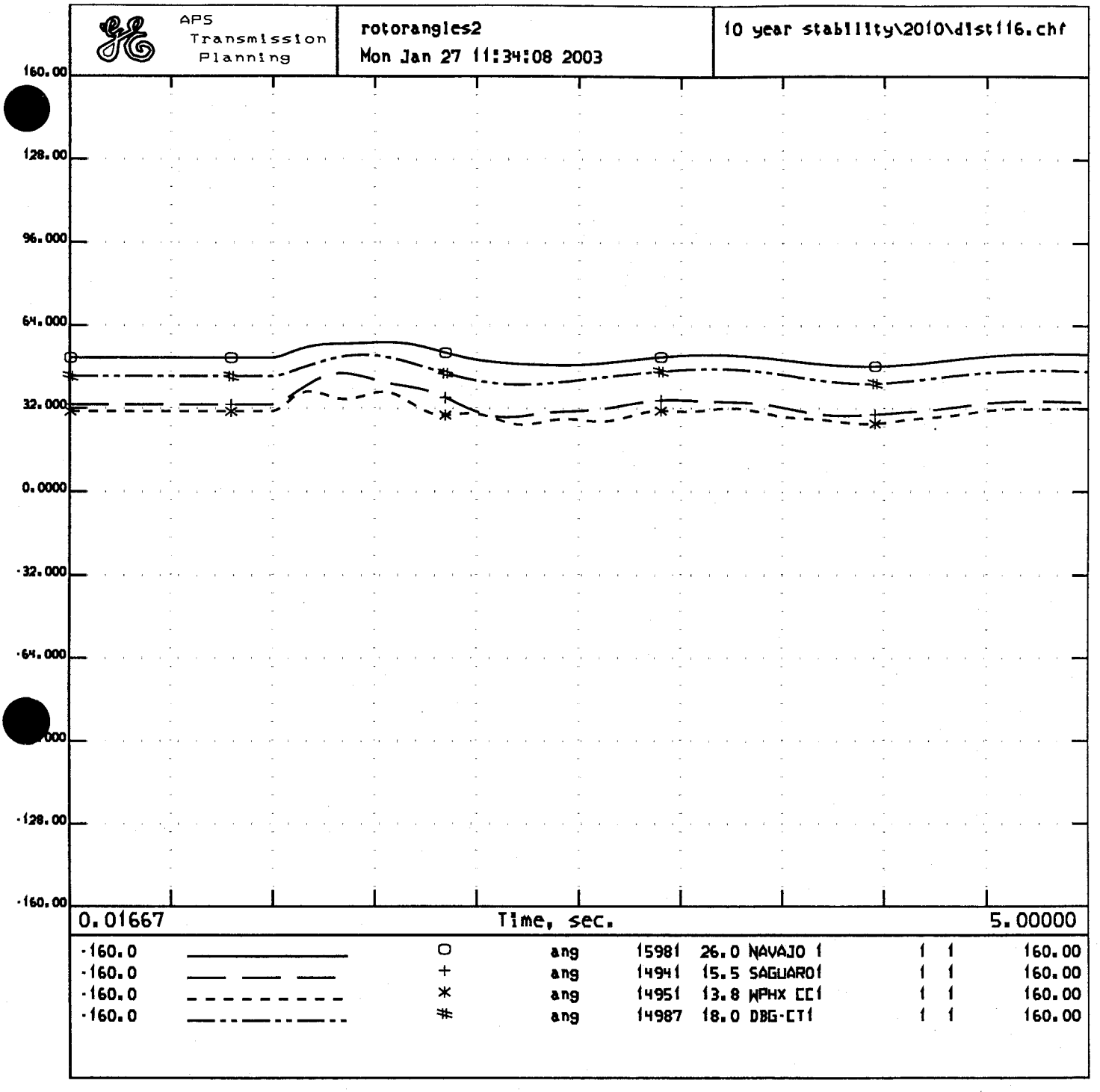
PNPK 345KV FLT PP-CH LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
PP-CH STAB #1; 01/03; T-O 3P FLT PP345;
4C CLR FLT W/PP-CH;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



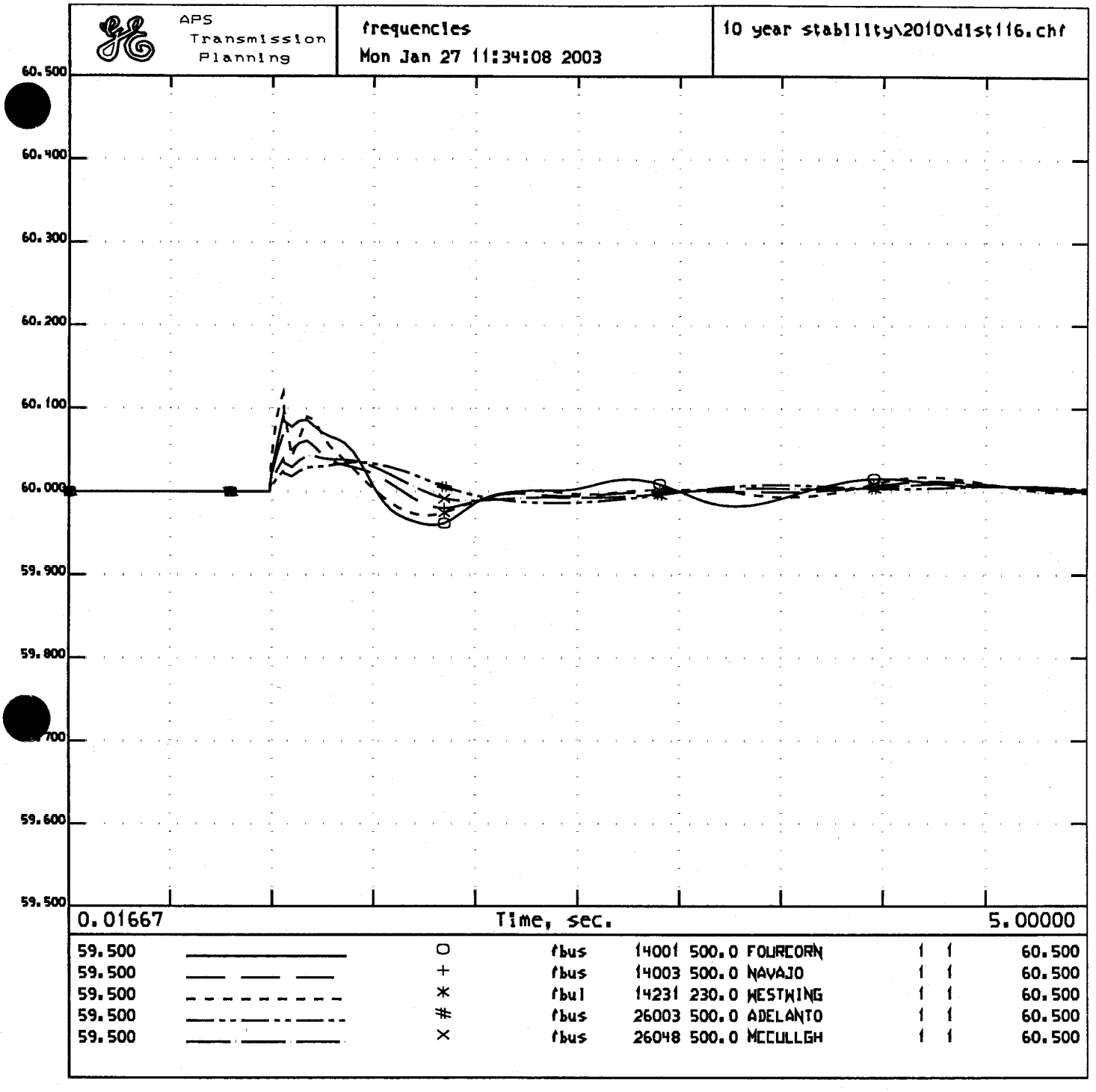
PNPK 345KV FLT PP-CH LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
PP-CH STAB #1; 01/03; T=0 3P FLT PP345;
4C CLR FLT W/PP-CH;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



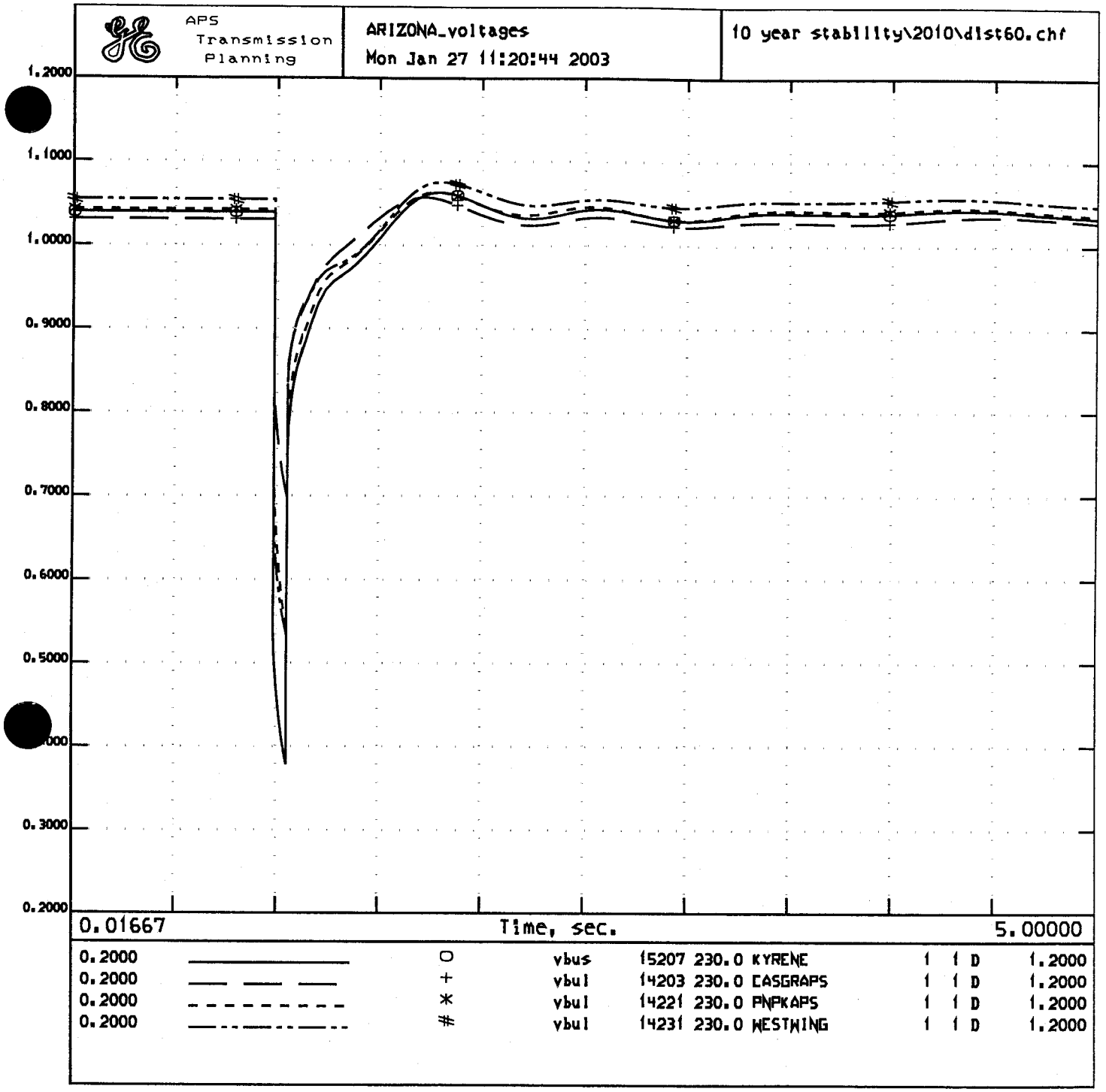
PNPK 345KV FLT PP-CH LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
PP-CH STAB #1; 01/03; T=0 3P FLT PP345;
4C CLR FLT W/PP-CH;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



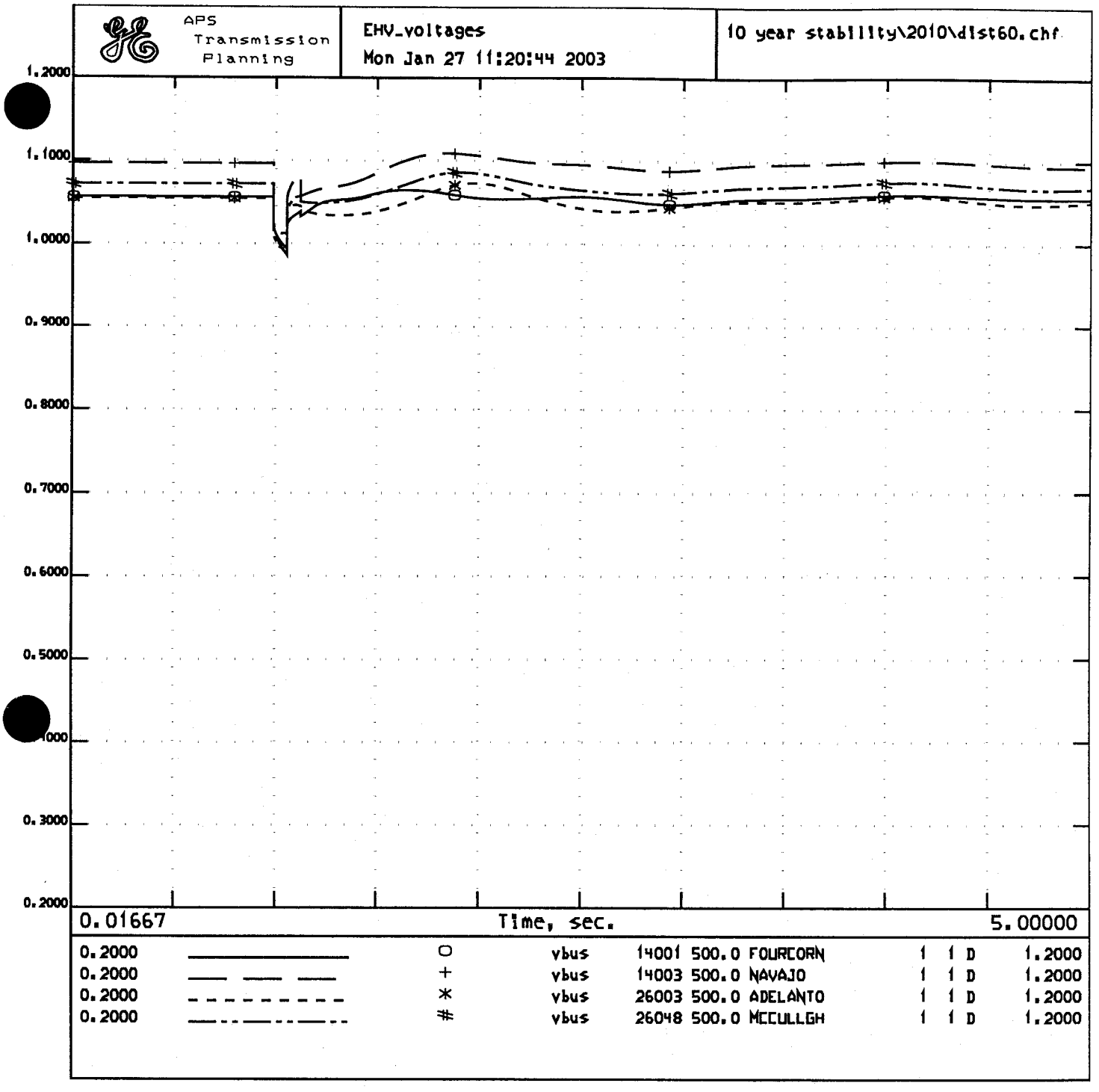
PNPK 345KV FLT PP-CH LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
PP-CH STAB s1; 01/03; T=0 3P FLT PP345;
4C CLR FLT W/PP-CH;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



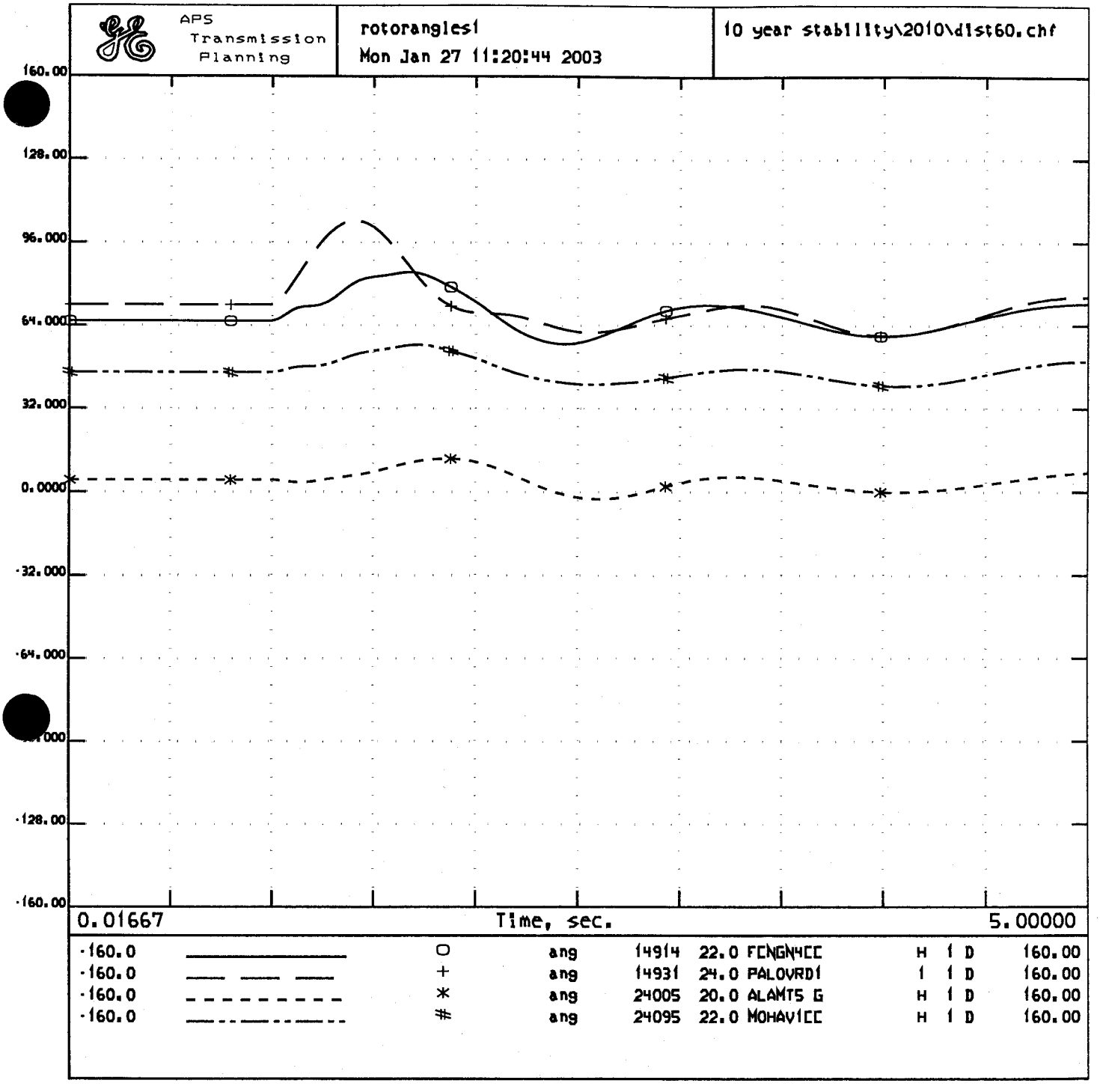
RUDD FLT JOJOBA-RUDD LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
JJ-RUDD STAB :1; 01/03; T=0 3P FLT RD500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/JJ-RUDD;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



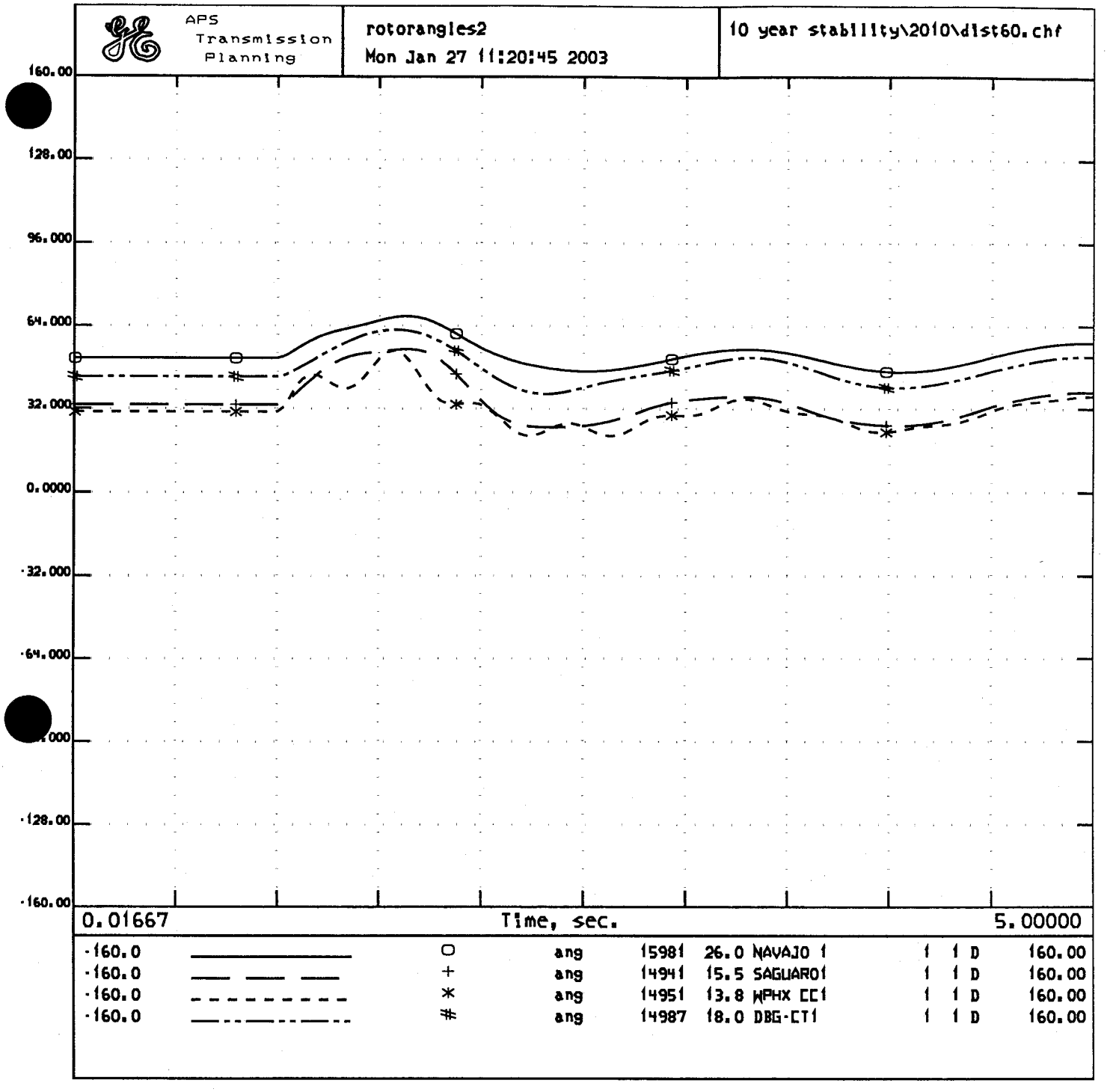
RUDD FLT JOJOBA-RUDD LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
JJ-RUDD STAB #1; 01/03; T=0 3P FLT RD500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/JJ-RUDD;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



RUDD FLT JOJOBA-RUDD LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
JJ-RUDD STAB =1; 01/03; T=0 3P FLT RD500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/JJ-RUDD;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



RUDD FLT JOJOBA-RUDD LINE OUT
Originally the 2007 HSIA APPROVED BASE CASE
NOVEMBER 13, 2002
JJ-RUDD STAB #1; 01/03; T=0 3P FLT RD500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/JJ-RUDD;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
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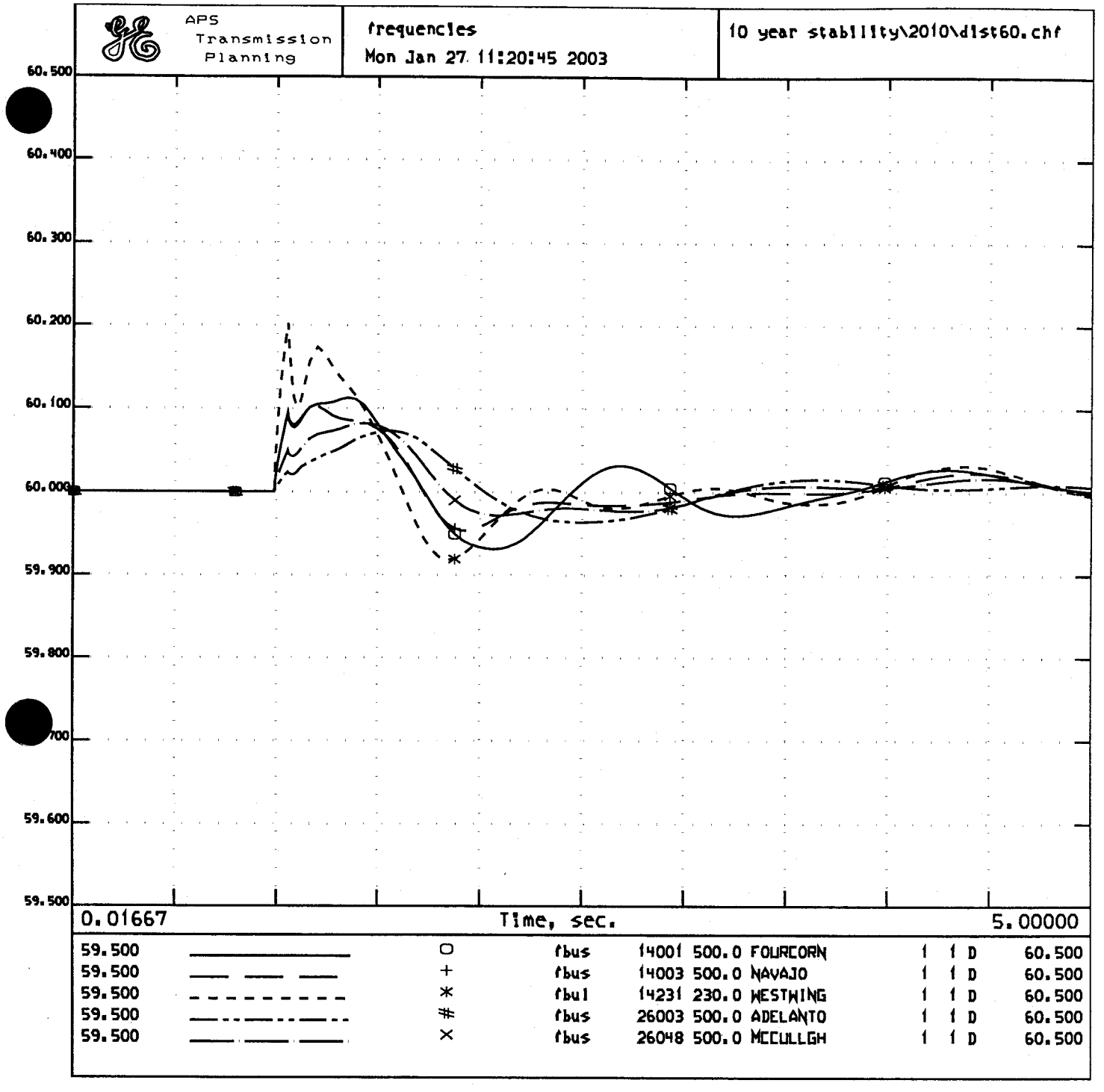
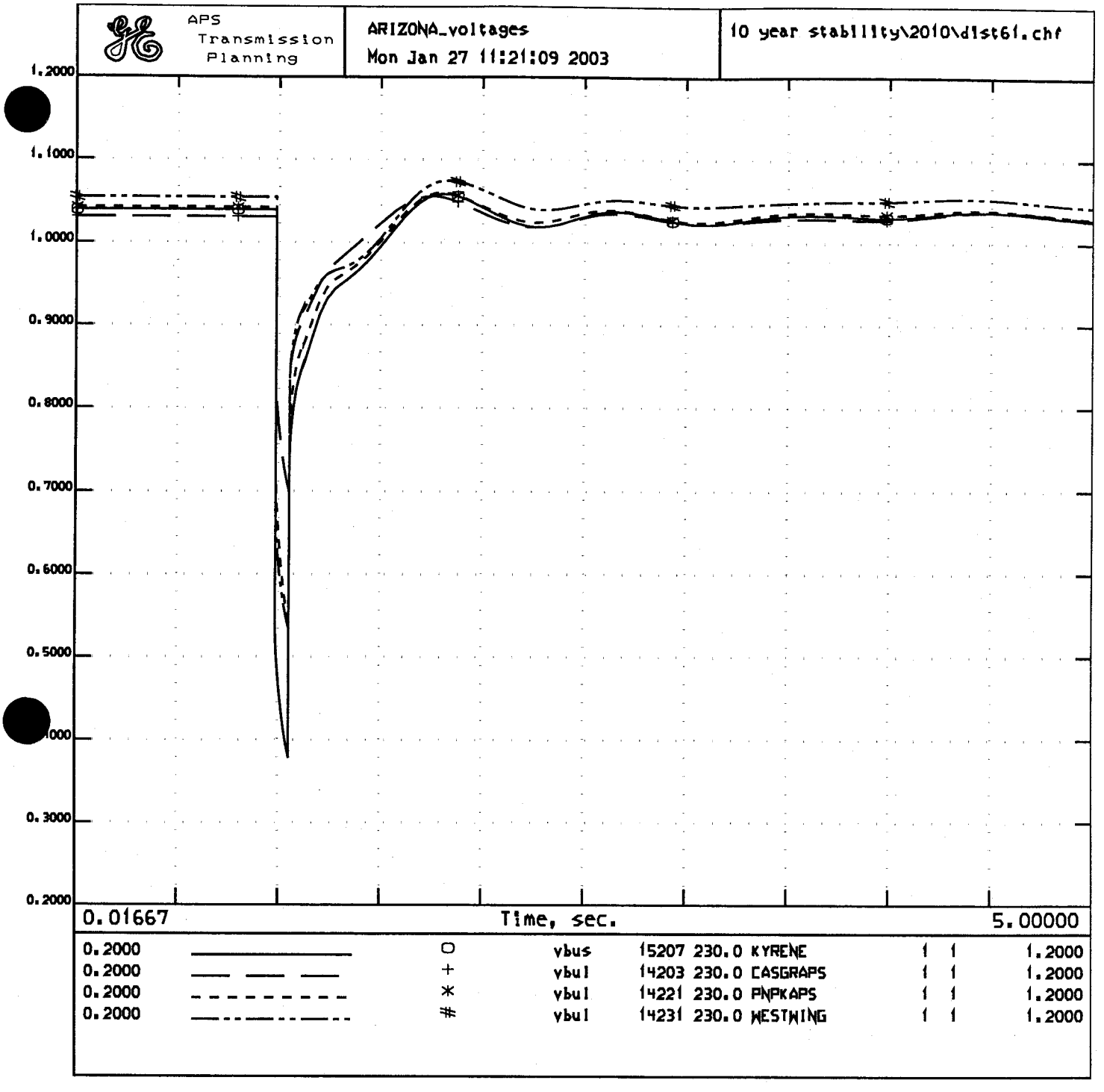


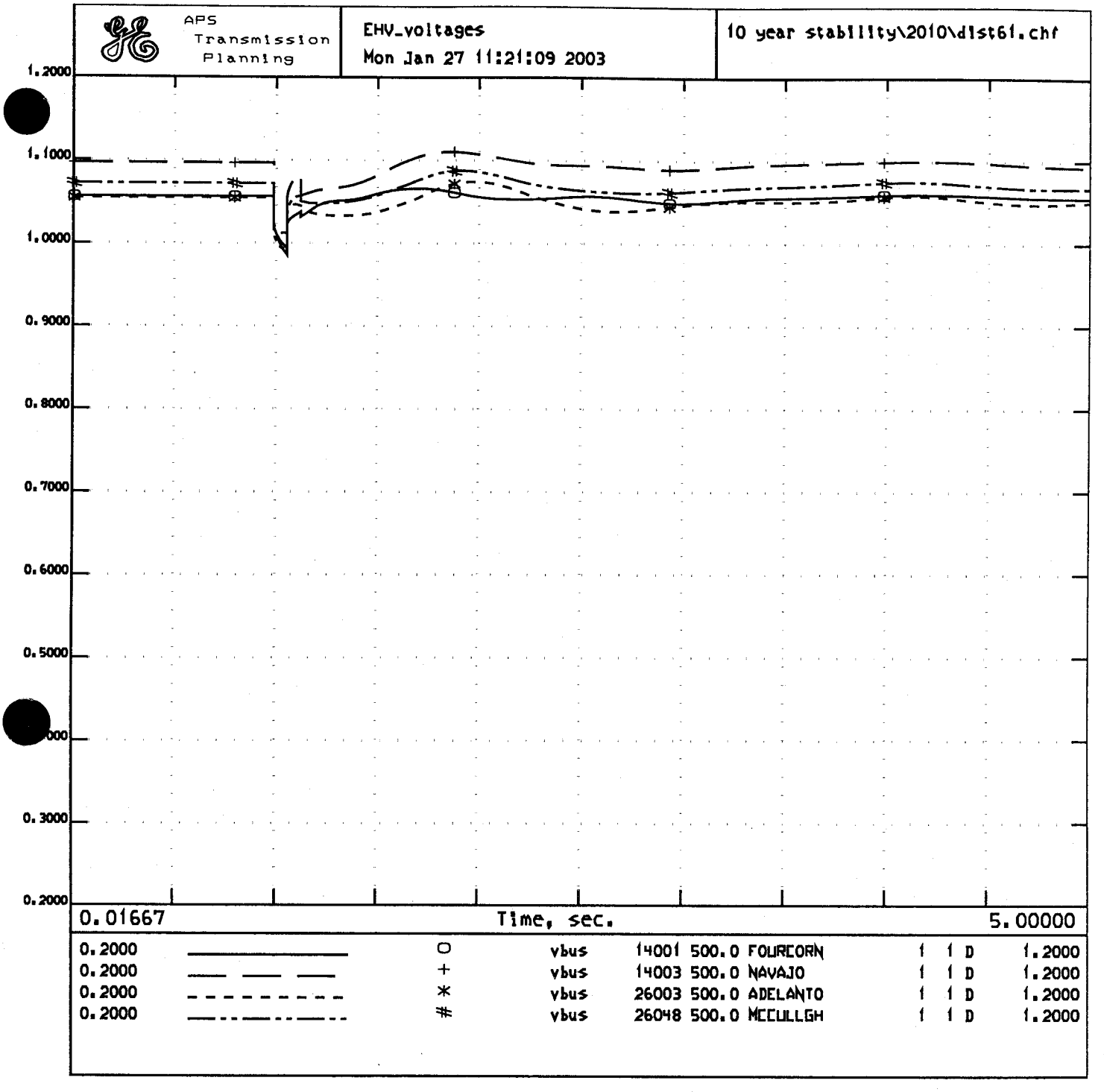
RUDD FLT JOJOBA-RUDD LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
JJ-RUDD STAB •1; 01/03; T=0 3P FLT RD500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/JJ-RUDD;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



RUDD FLT KYRENE-RUDD LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
KYR-RUDD STAB .1; 01/03; T=0 3P FLT RD500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/KYR-RUDD;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



RUDD FLT KYRENE-RUDD LINE OUT
Originally the 2007 HSIA APPROVED BASE CASE
NOVEMBER 13, 2002
KYR-RUDD STAB :1; 01/03; T=0 3P FLT RD500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/KYR-RUDD;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
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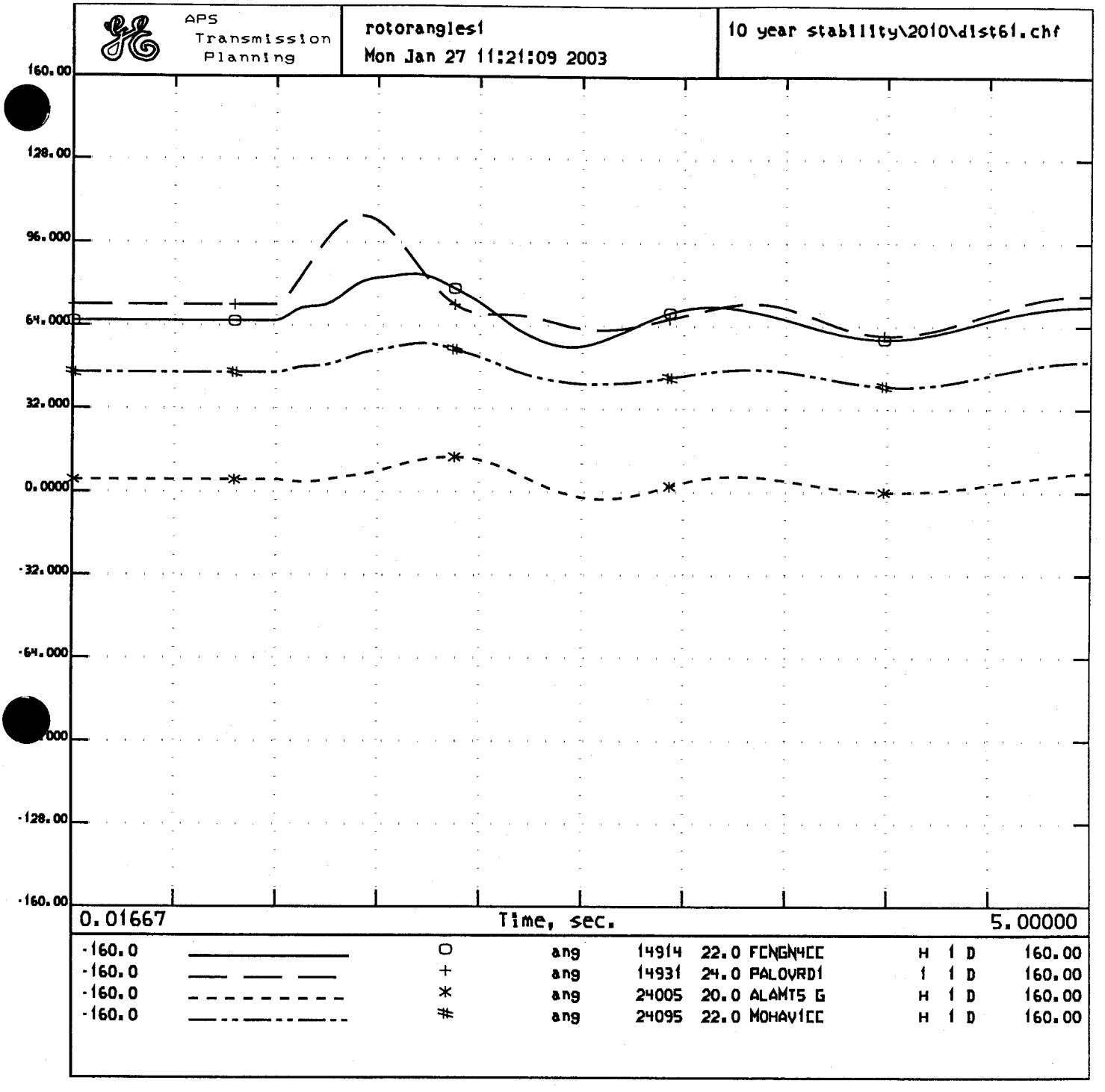
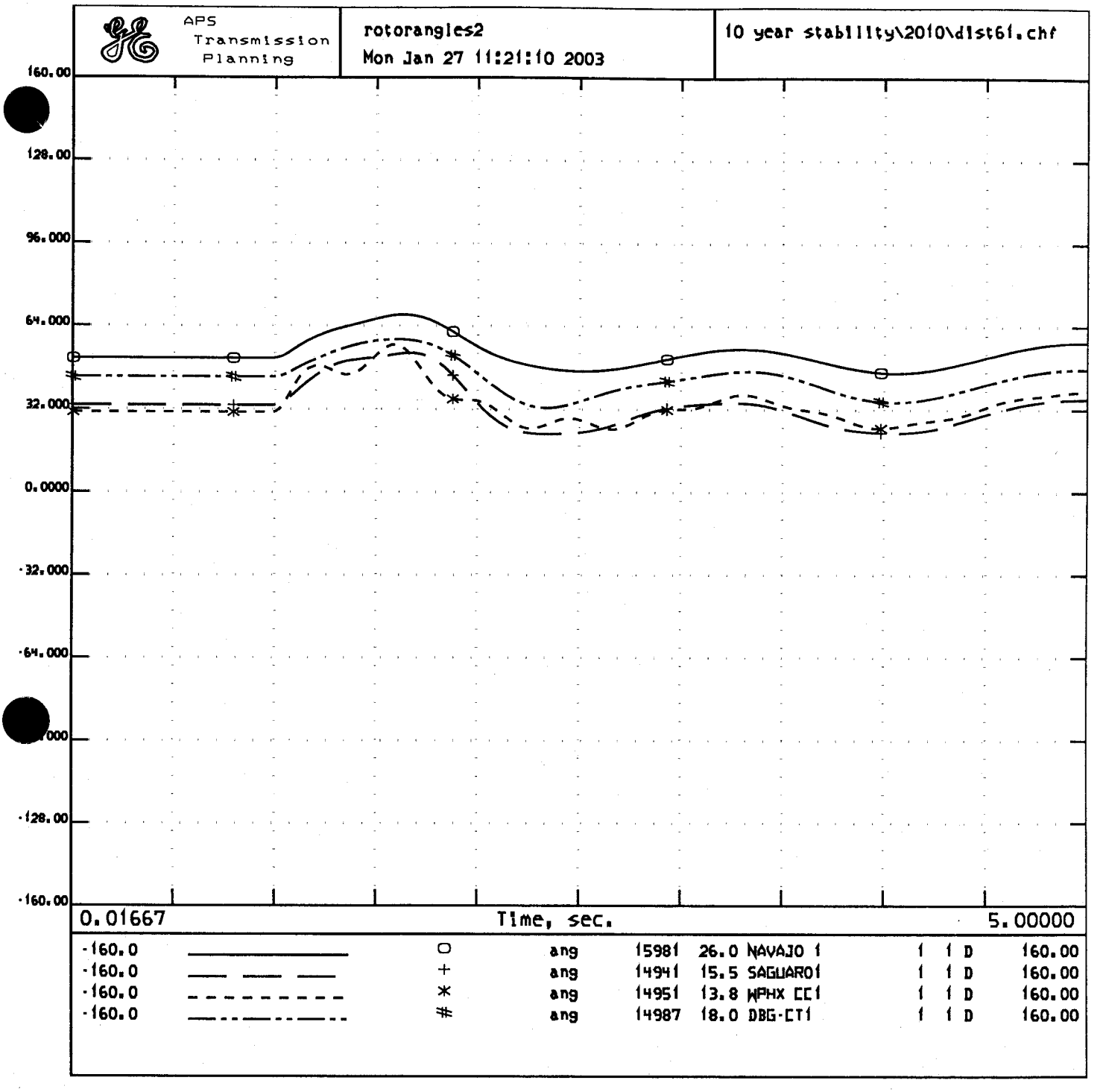


RUDD FLT KYRENE-RUDD LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
KYR-RUDD STAB :1; 01/03; T=0 3P FLT RD500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/KYR-RUDD;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



RUDD FLT KYRENE-RUDD LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
KYR-RUDD STAB #1; 01/03; T=0 3P FLT RD500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/KYR-RUDD;8C REIN;2010.dyd;WSCC.bpt

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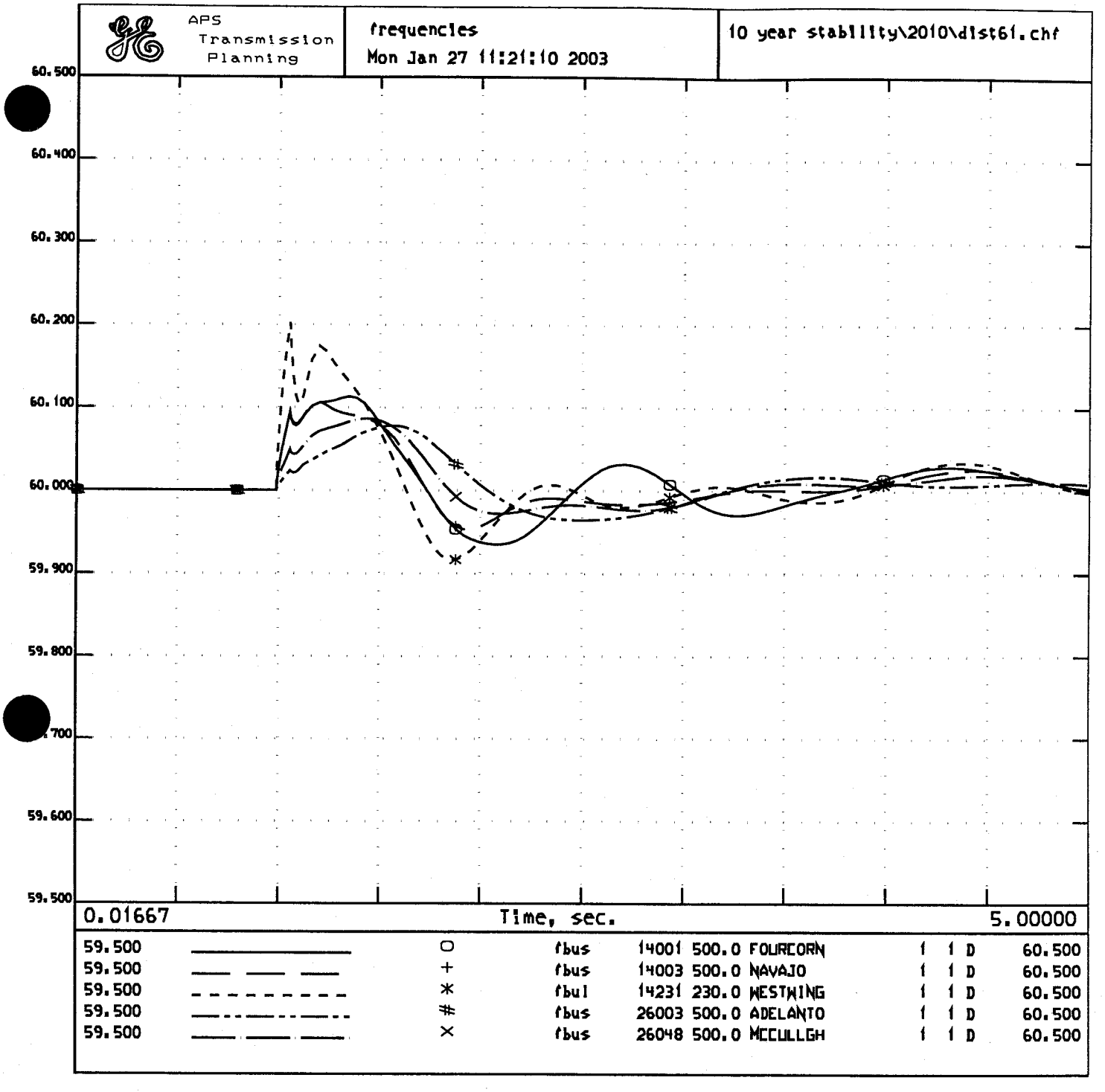

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NOVEMBER 13, 2002
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NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/KYR-RUDD;8C REIN;2010.dyd;WSCC.bpt

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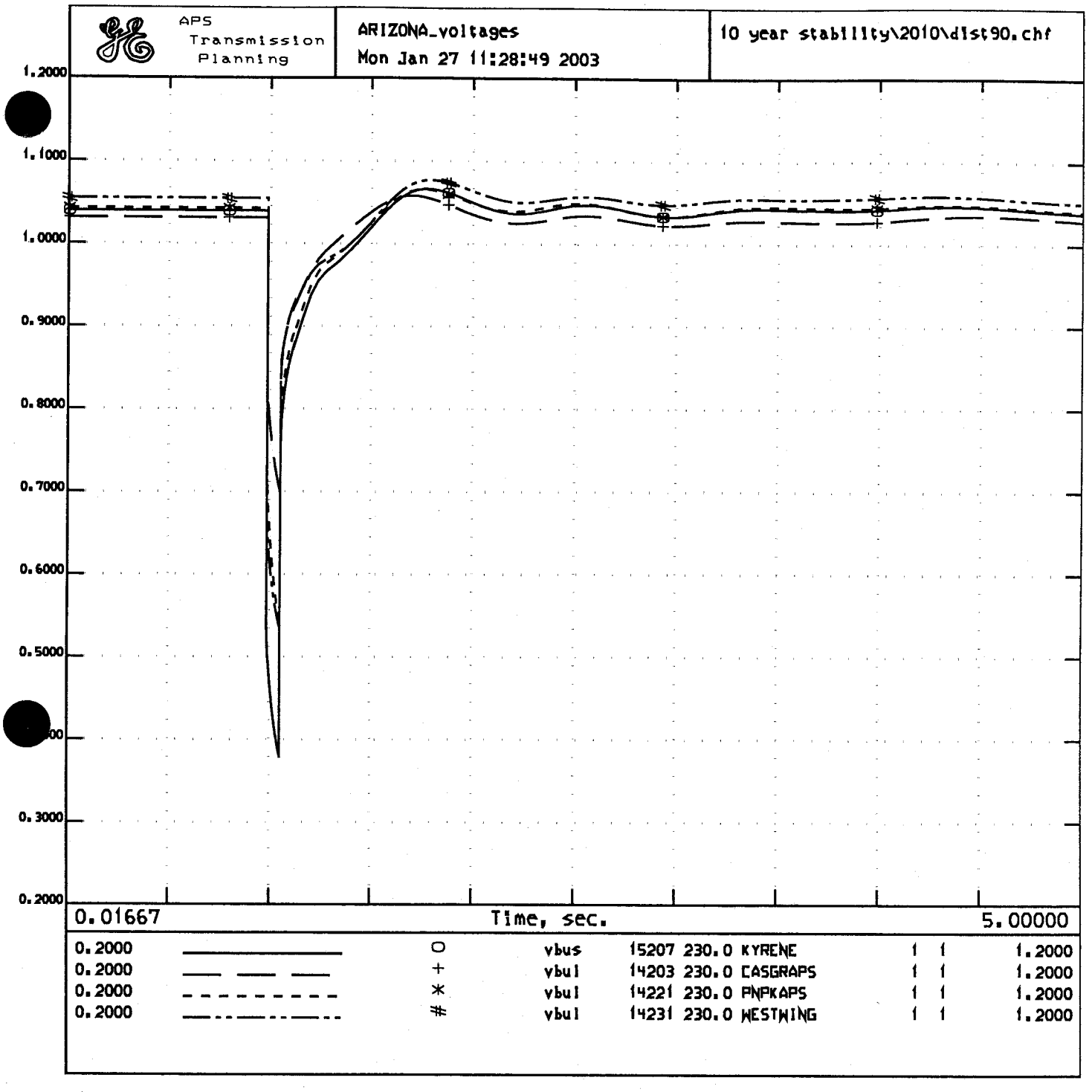
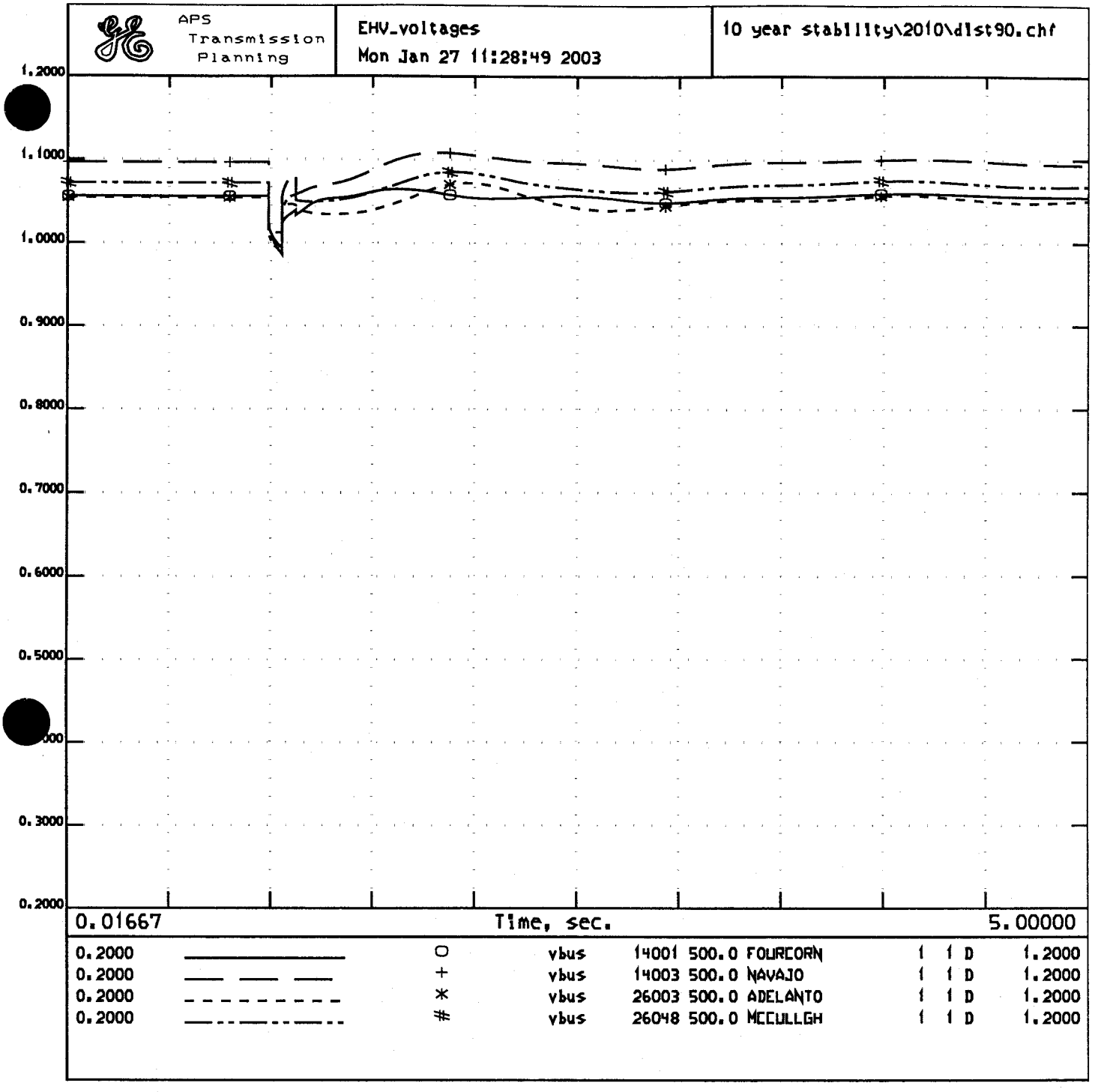


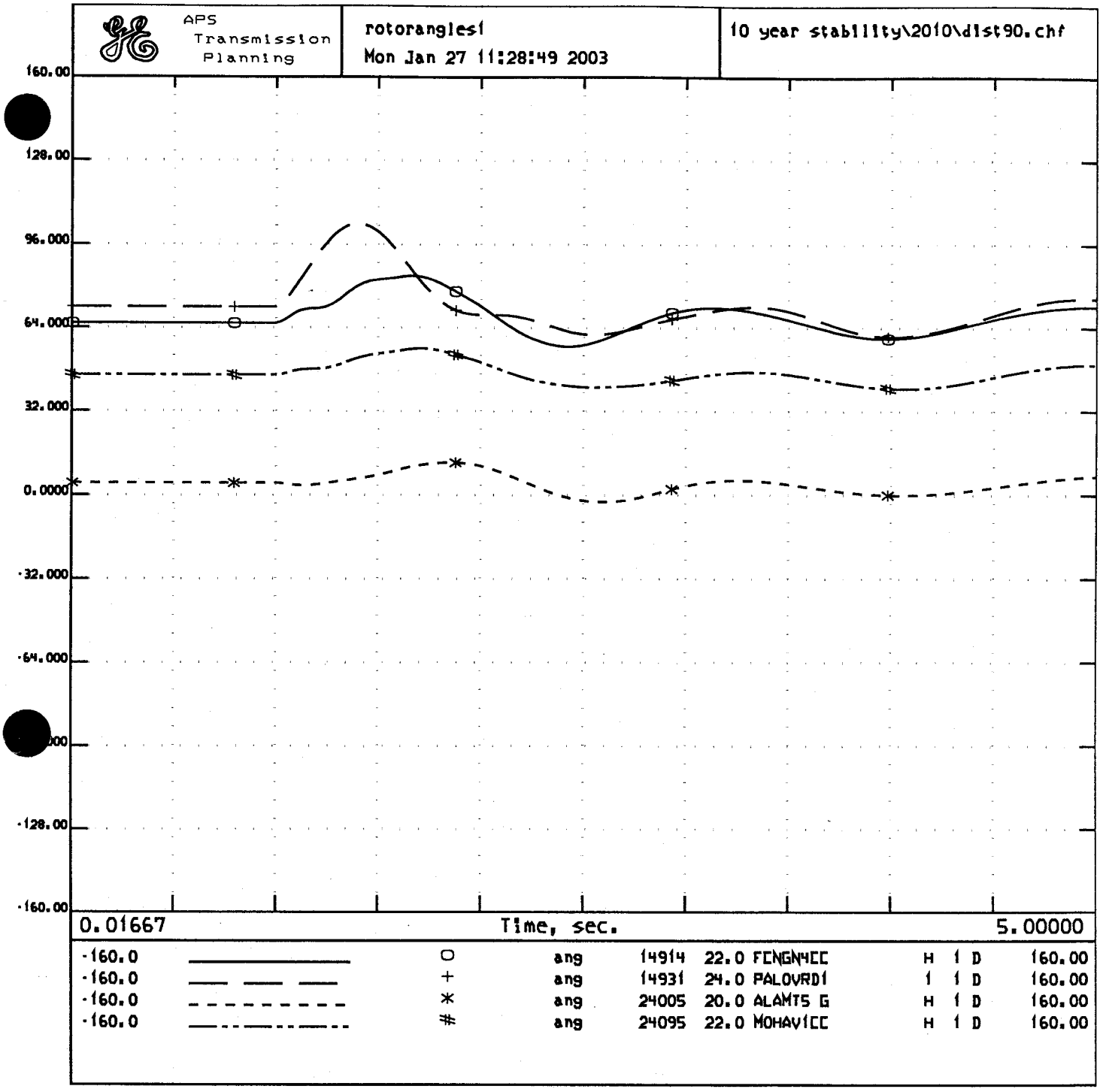
RUDD FLT PV-RUDD LINE OUT
Originally the 2007 HSIA APPROVED BASE CASE
NOVEMBER 13, 2002
PV-RUDD STAB #1; 01/03; T=0 3P FLT RUDD500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-RUDD;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



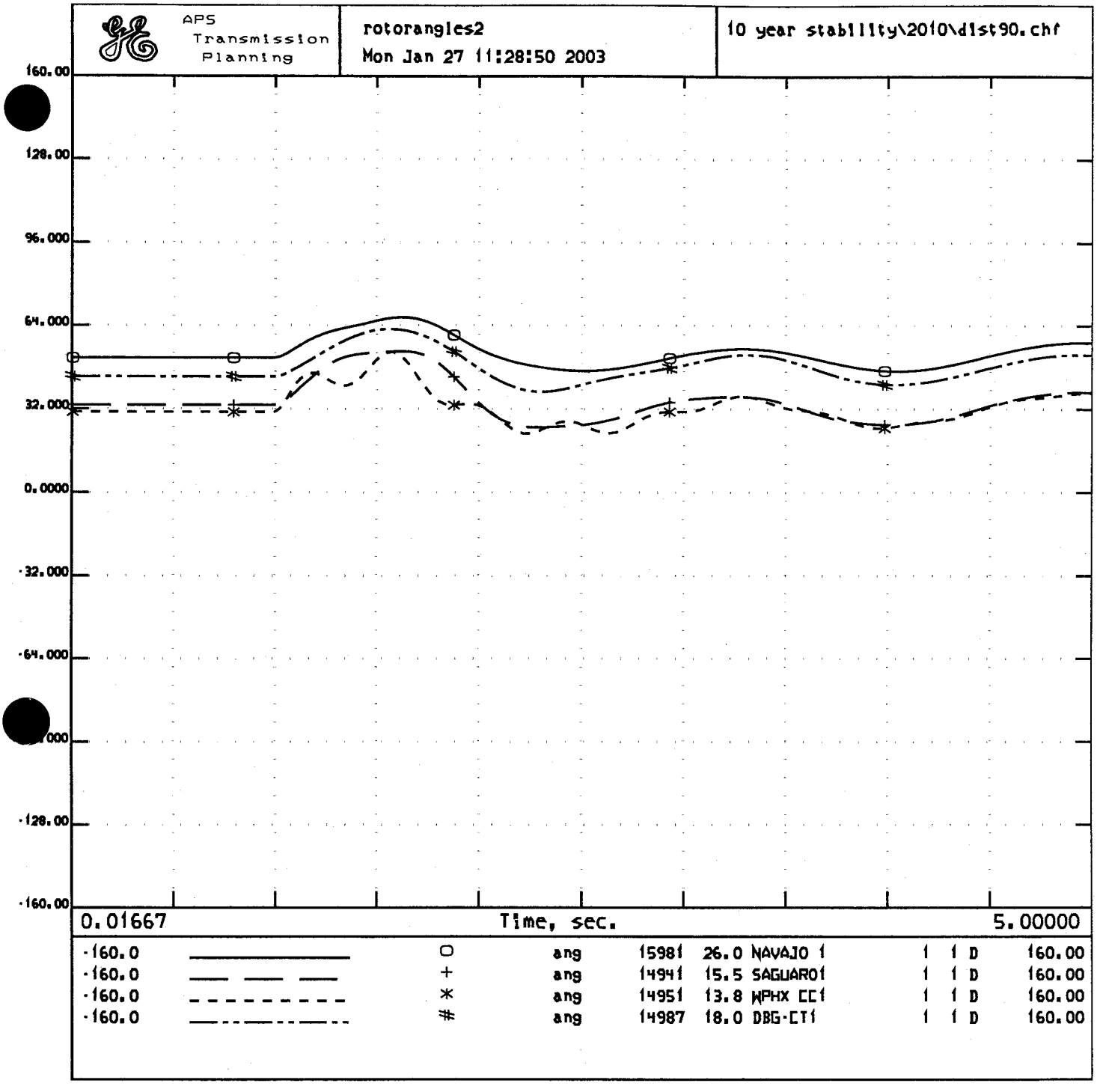
RUDD FLT PV-RUDD LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
PV-RUDD STAB :1; 01/03; T=0 3P FLT RUDD500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-RUDD;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



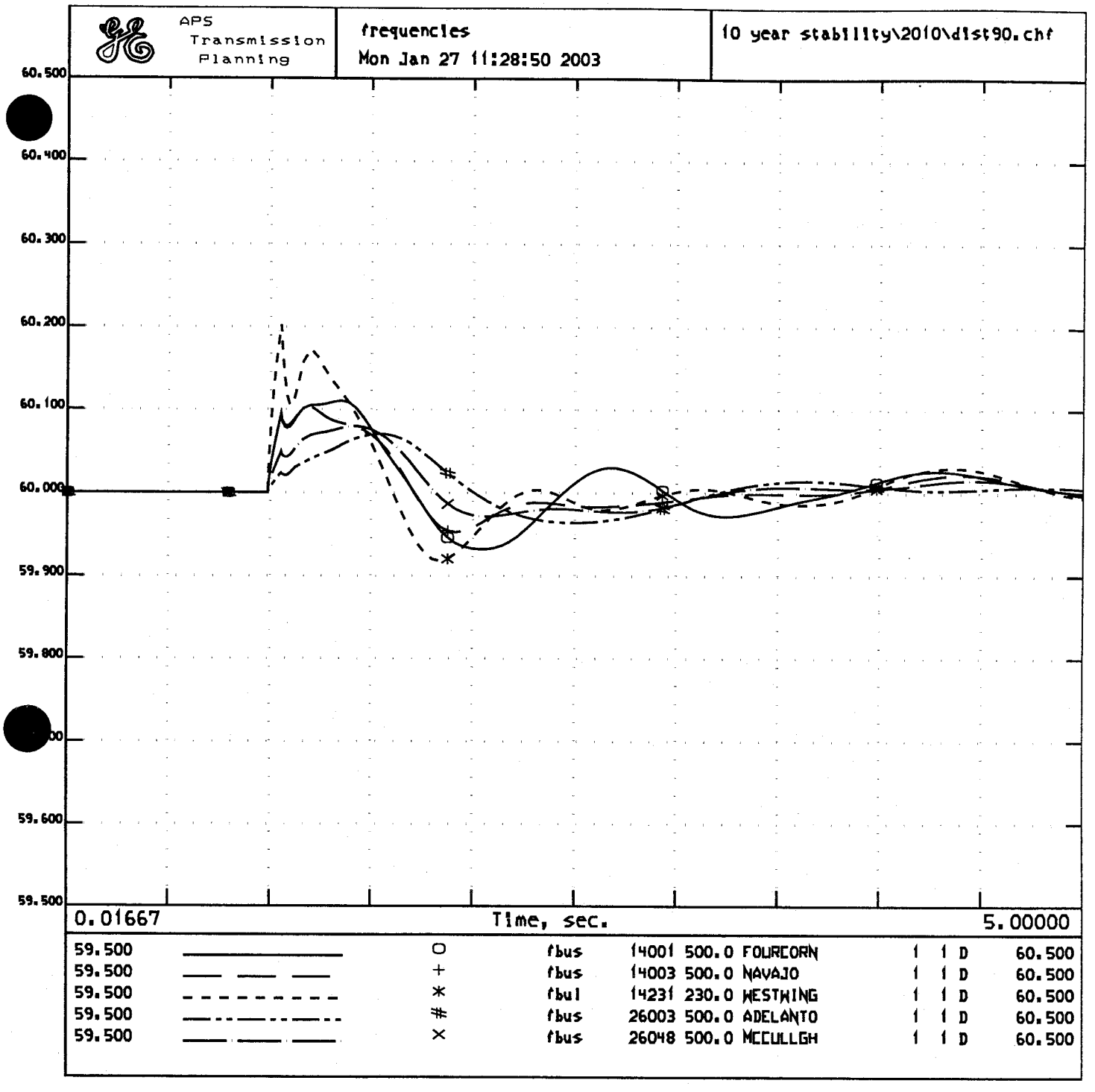
RUDD FLT PV-RUDD LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
PV-RUDD STAB s1; 01/03; T=0 3P FLT RUDD500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-RUDD;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



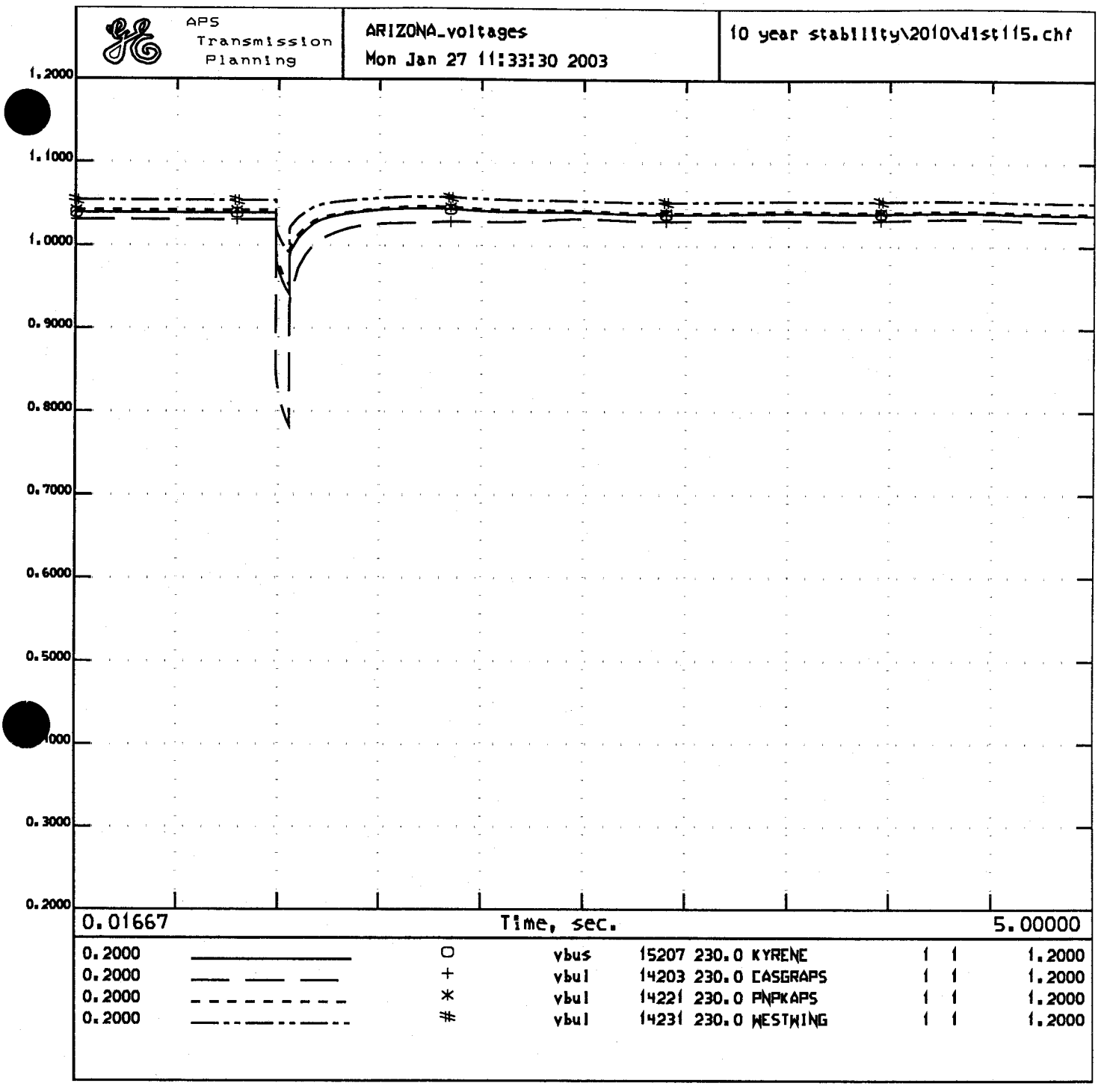
RUDD FLT PV-RUDD LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
PV-RUDD STAB #1; 01/03; T=0 3P FLT RUDD500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-RUDD;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



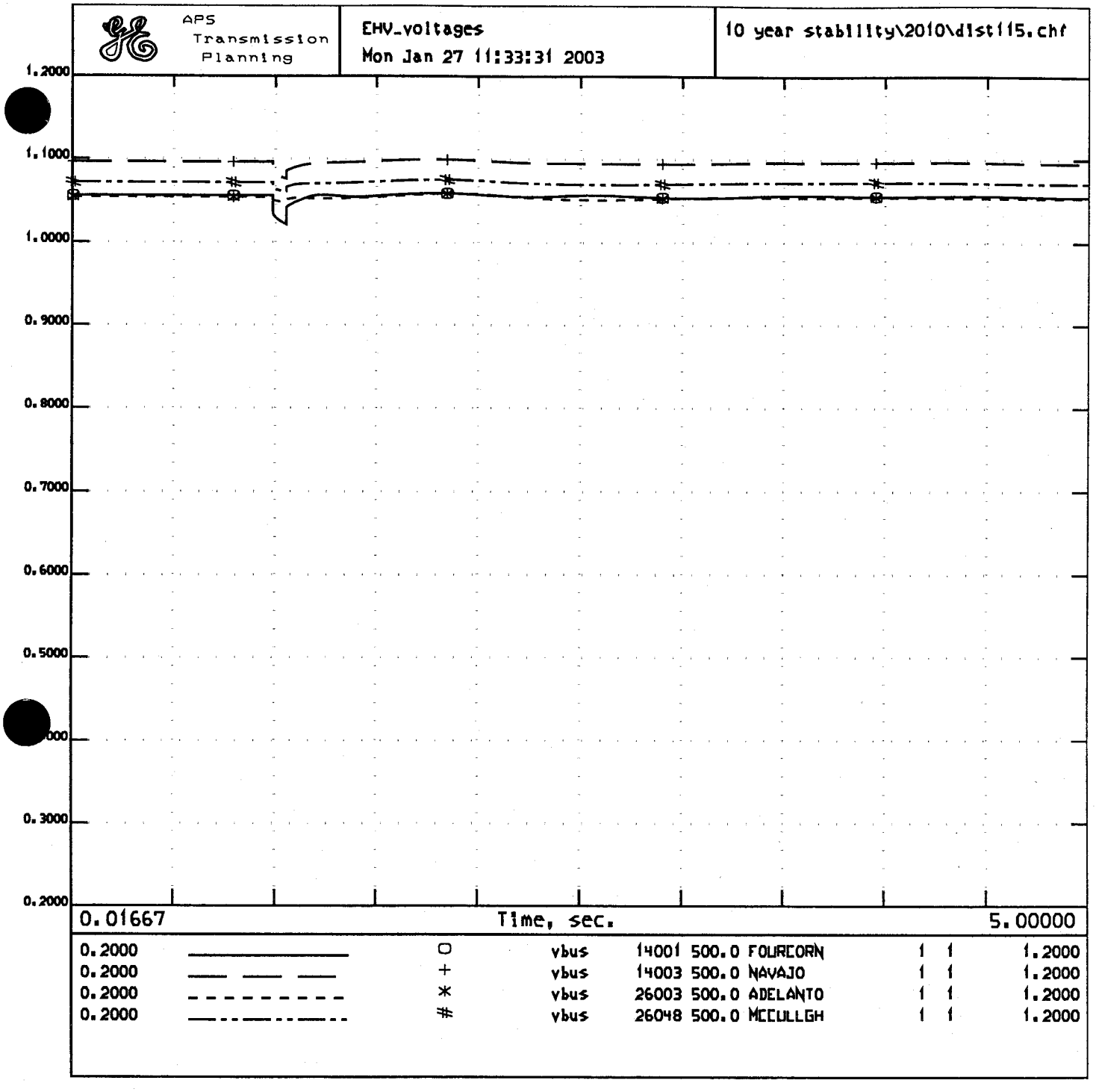
RUDD FLT PV-RUDD LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
PV-RUDD STAB .1; 01/03; T=0 3P FLT RUDD500;10% FLT DMPING;FLSH CAPS
NAV-MKP/MKP-YAV,PV-DV/NG;4C CLR FLT W/PV-RUDD;8C REIN;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



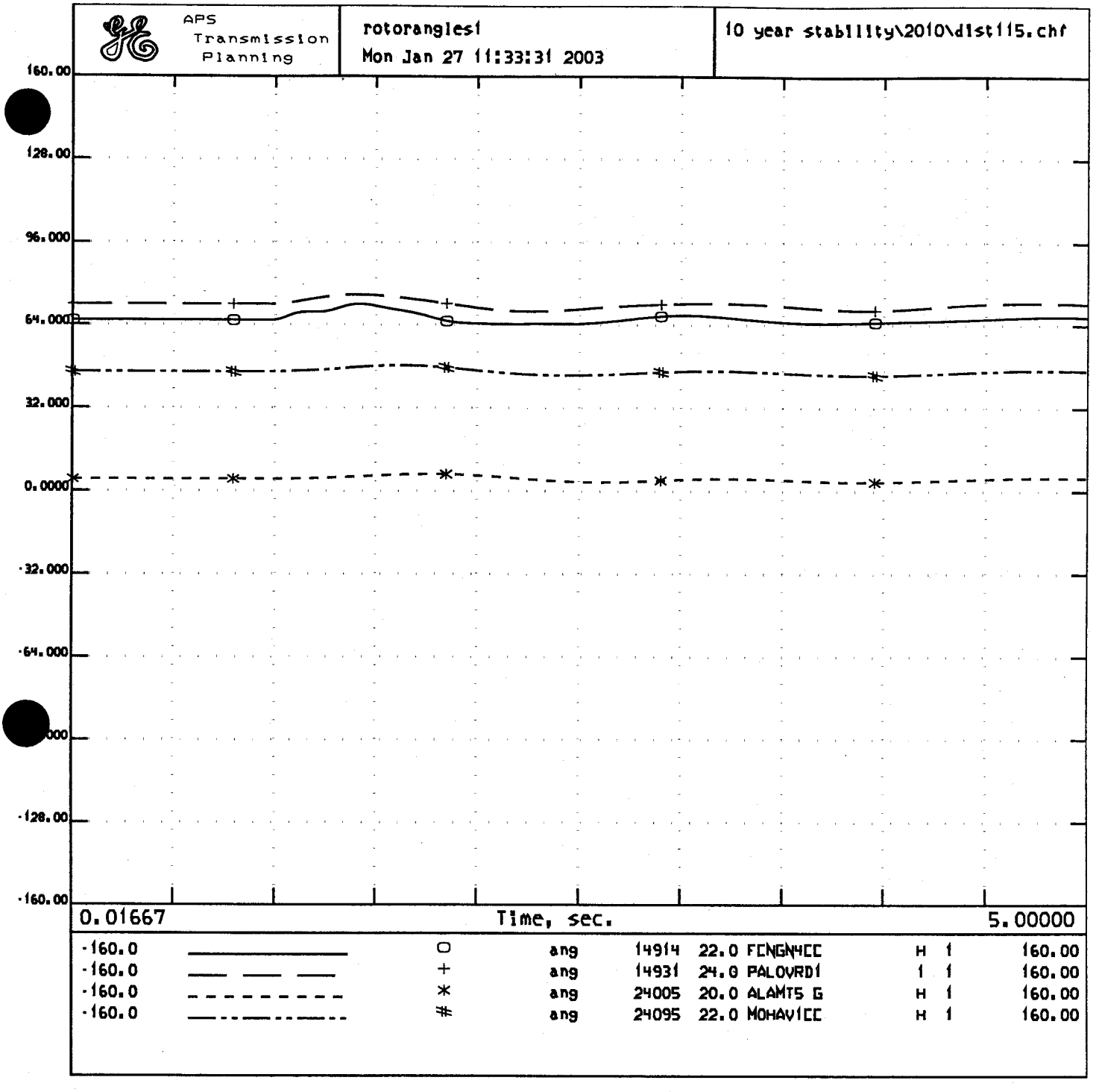
SAGUARO FLT SAG-SK LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
SAG-SK STAB #1; 01/03; T=0 3P FLT SAG500;
4C CLR FLT W/SAG-SK;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



SAGUARO FLT SAG-SK LINE OUT
Originally the 2007 HSIA APPROVED BASE CASE
NOVEMBER 13, 2002
SAG-SK STAB #1; 01/03; T=0 3P FLT SAG500;
4C CLR FLT W/SAG-SK;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



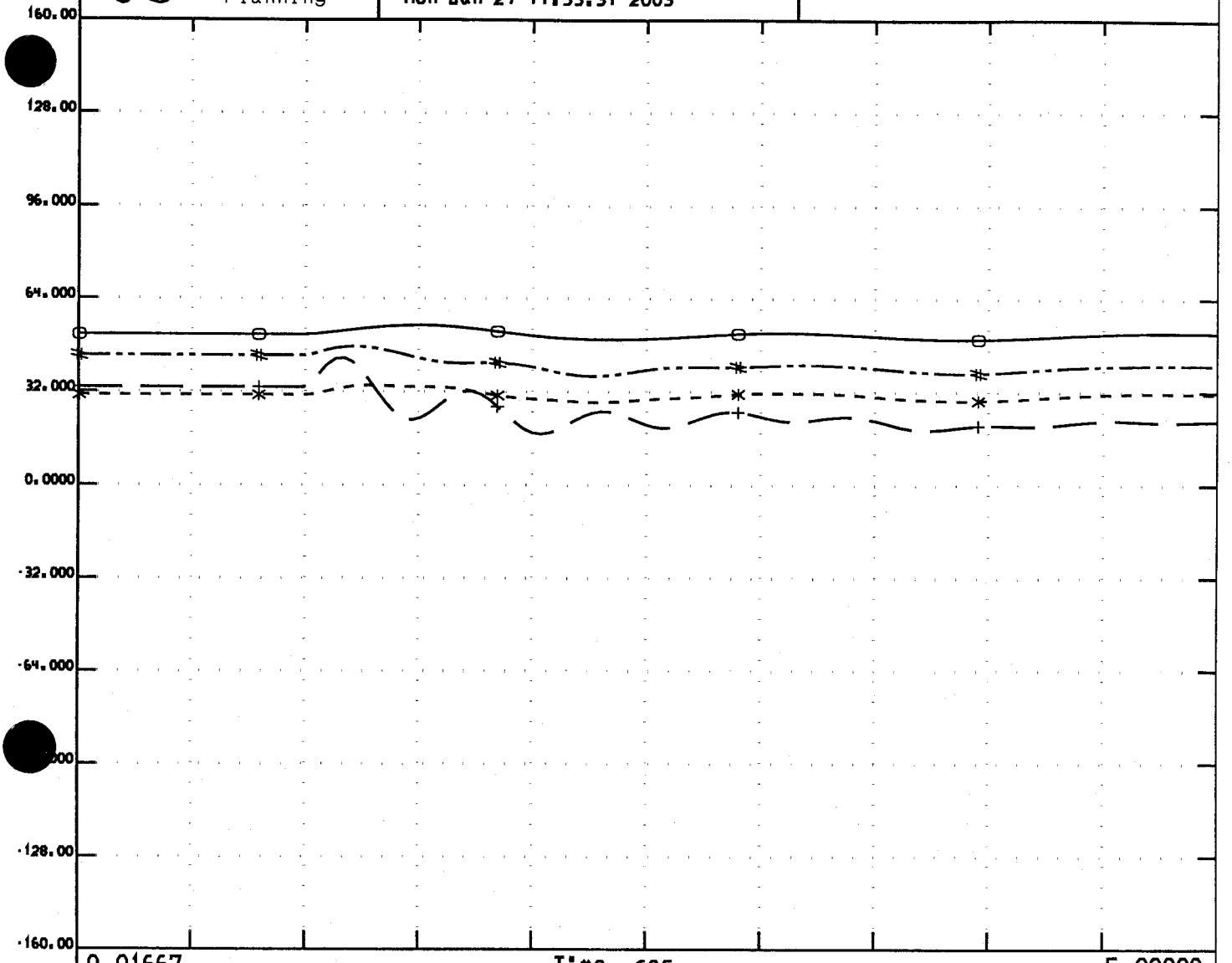
SAGUARO FLT SAG-SK LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
SAG-SK STAB #1; 01/03; T=0 3P FLT SAG500;
4C CLR FLT W/SAG-SK;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.

APS Transmission Planning

rotorangles2
Mon Jan 27 11:33:31 2003

10 year stability\2010\dist115.chf



0.01667 Time, sec. 5.00000

-160.0	————————	o	ang	15981	26.0 NAVAJO 1	1	1	160.00
-160.0	— — —	+	ang	14941	15.5 SAGUARO1	1	1	160.00
-160.0	- - - - - - - -	*	ang	14951	13.8 WPHX CC1	1	1	160.00
-160.0	—-—-—-—	#	ang	14987	18.0 DBG-CT1	1	1	160.00

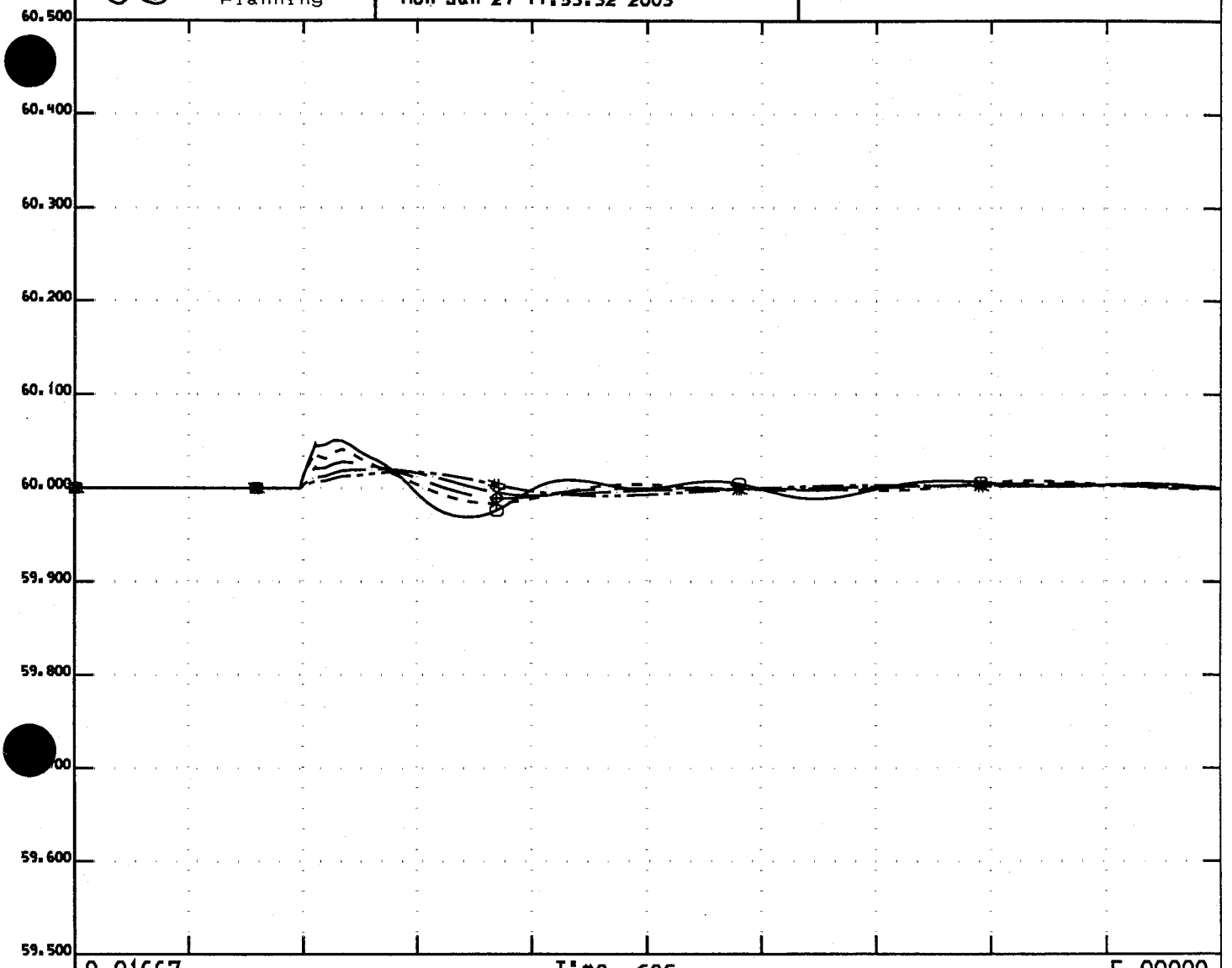
SAGUARO FLT SAG-SK LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
SAG-SK STAB #1; 01/03; T=0 3P FLT SAG500;
4C CLR FLT W/SAG-SK;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.

APS Transmission Planning

frequencies
Mon Jan 27 11:33:32 2003

10 year stability\2010\dist115.chf

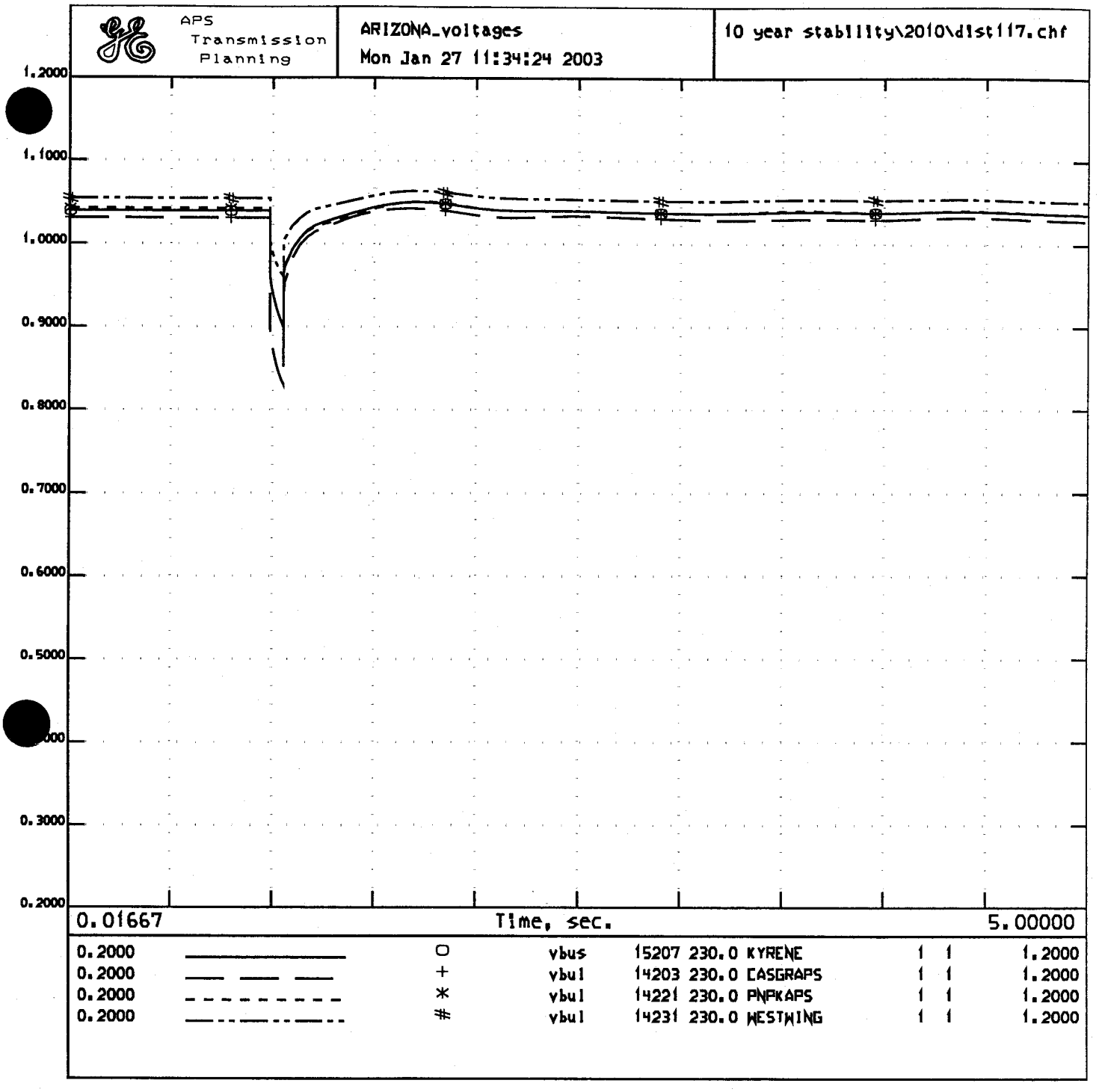


0.01667 Time, sec. 5.00000

59.500	———	O	fbus	14001	500.0	FOURCORN	1	1	60.500
59.500	— — —	+	fbus	14003	500.0	NAVAJO	1	1	60.500
59.500	- - - - - - - -	*	fbul	14231	230.0	WESTWING	1	1	60.500
59.500	—·—·—·—	#	fbus	26003	500.0	ADELANTO	1	1	60.500
59.500	— — —	X	fbus	26048	500.0	MCCULLGH	1	1	60.500

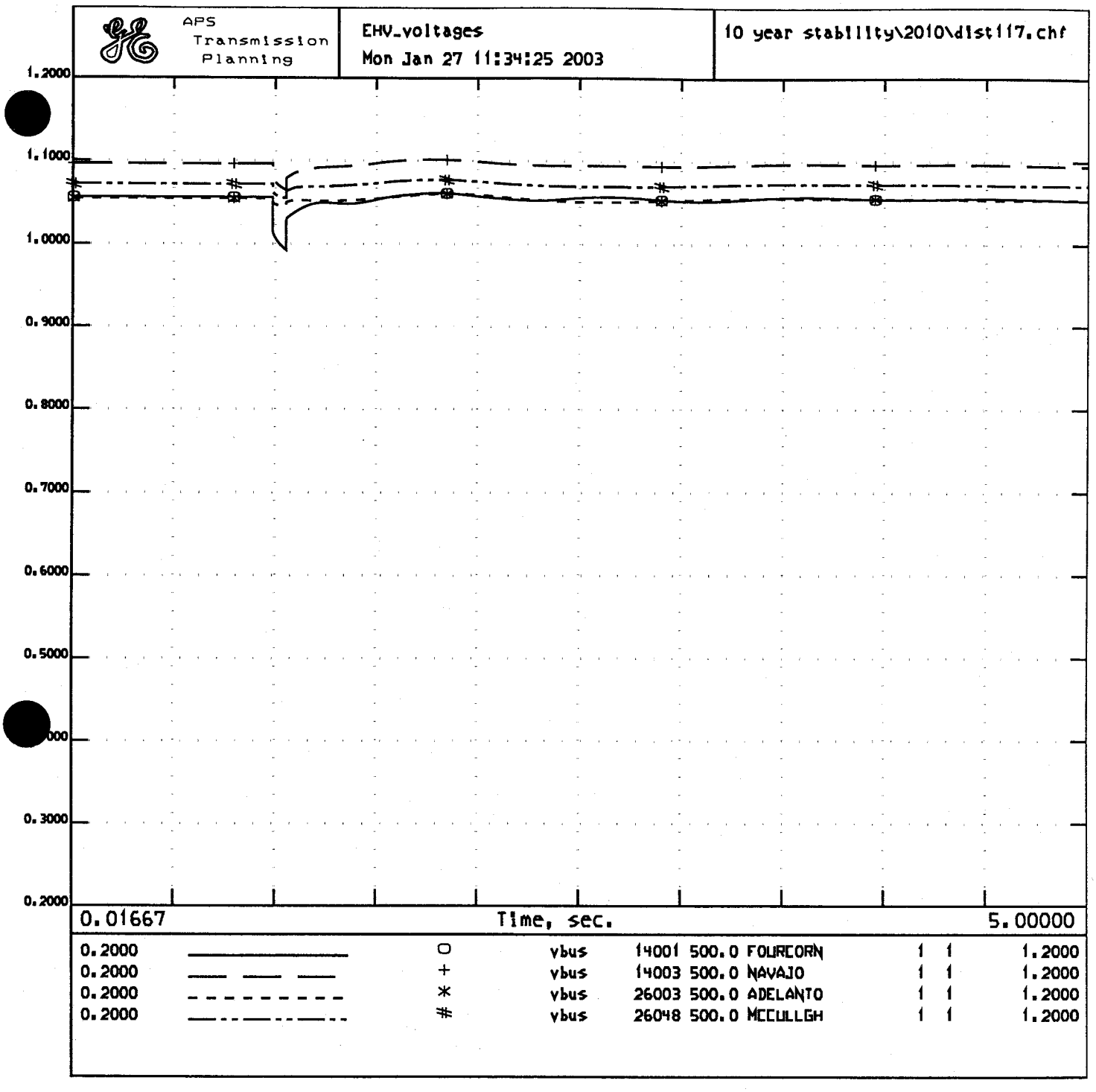
SAGUARO FLT SAG-SK LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
SAG-SK STAB #1; 01/03; T=0 3P FLT SAG500;
4C CLR FLT W/SAG-SK;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



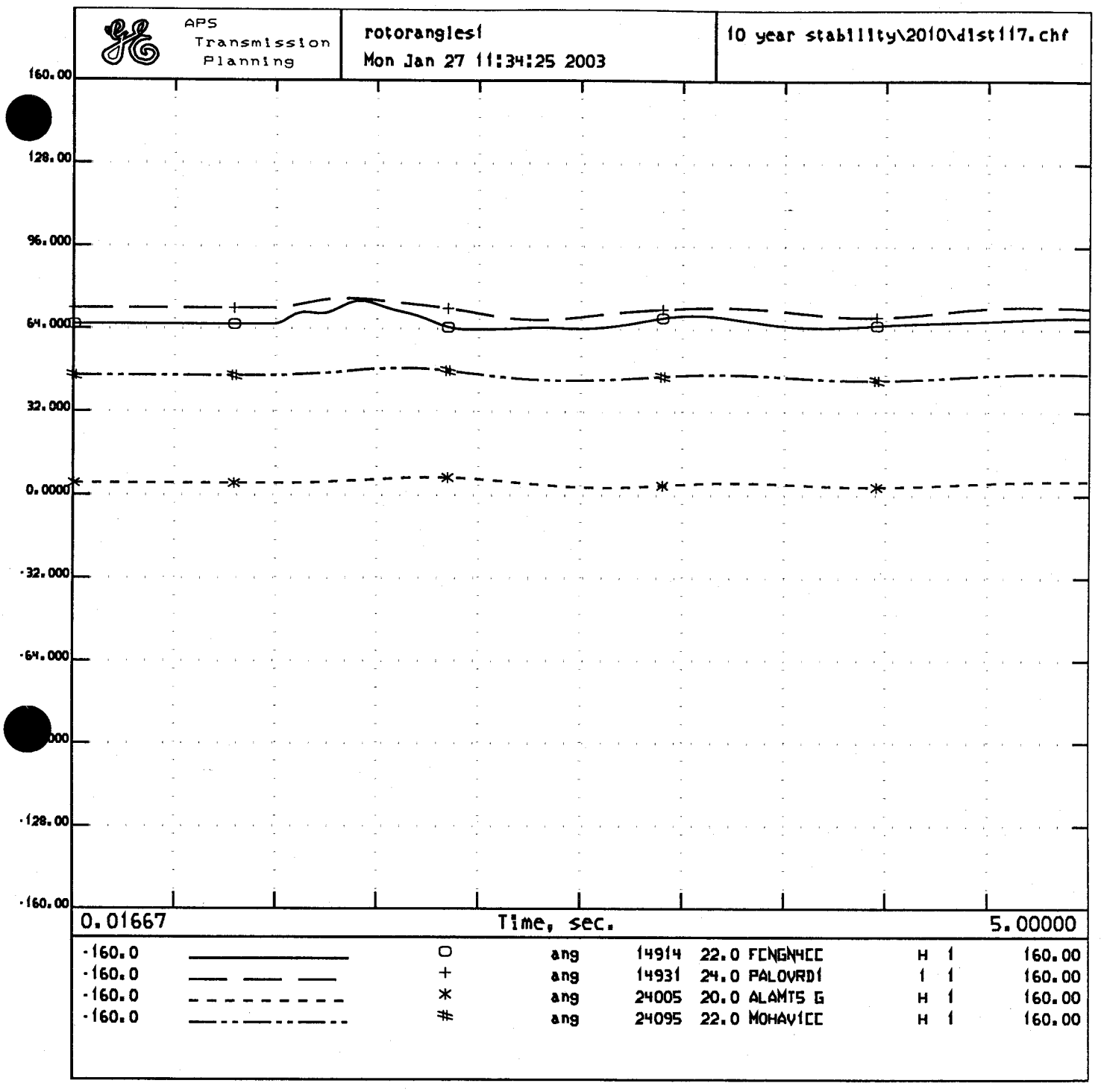
SILVERKING FLT CH-SK LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
CH-SK STAB #1; 01/03; T=0 3P FLT SKX500;
4C CLR FLT W/CH-SK;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



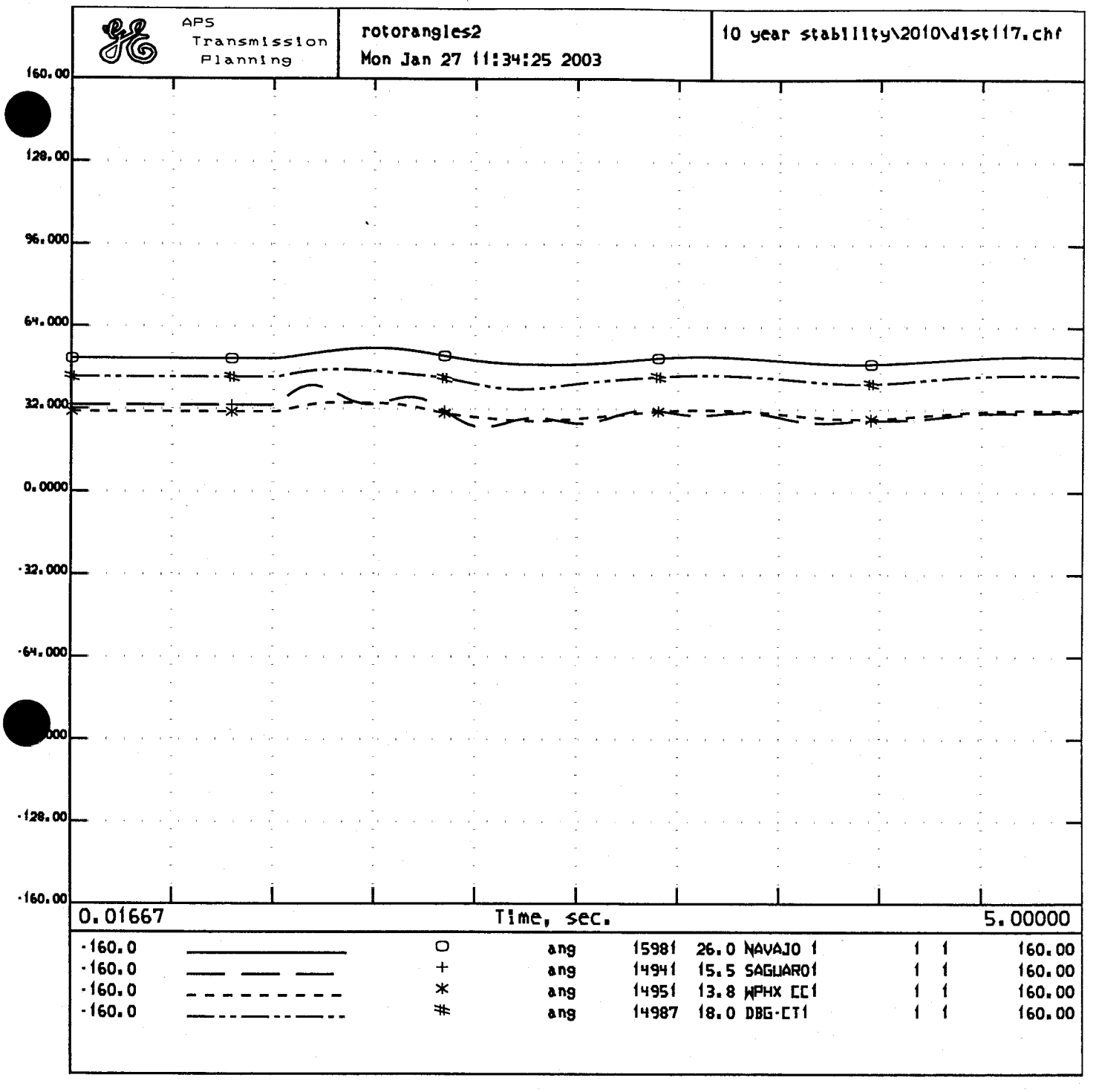
SILVERKING FLT CH-SK LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
CH-SK STAB #1; 01/03; T=0 3P FLT SKX500;
4C CLR FLT W/CH-SK;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



SILVERKING FLT CH-SK LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
CH-SK STAB #1; 01/03; T=0 3P FLT SKX500;
4C CLR FLT W/CH-SK;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



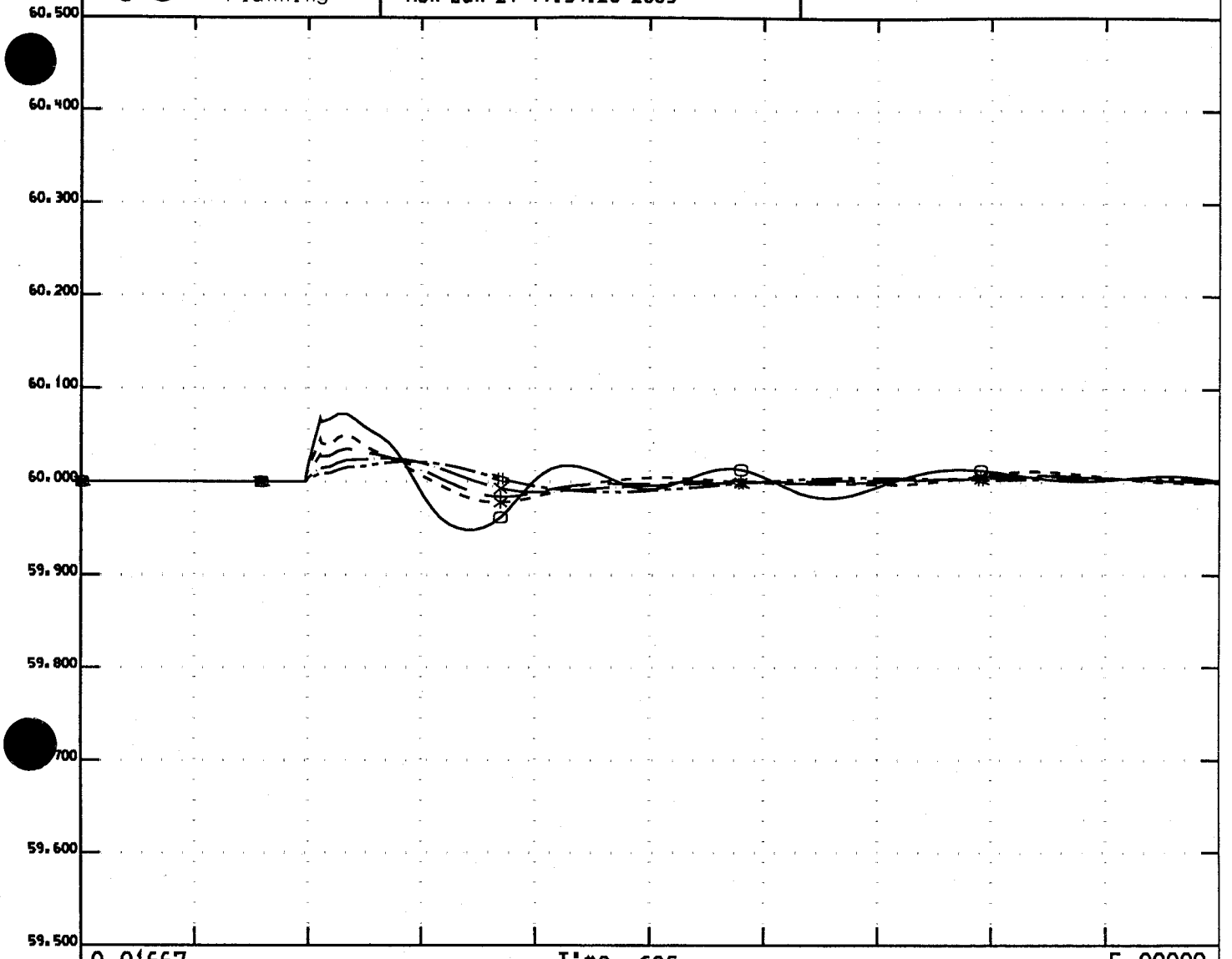
SILVERKING FLT CH-SK LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
CH-SK STAB =1; 01/03; T=0 3P FLT SKX500;
4C CLR FLT W/CH-SK;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.

APS Transmission Planning

frequencies
Mon Jan 27 11:34:26 2003

10 year stability\2010\dlst117.chf



0.01667 Time, sec. 5.00000

59.500	————	O	fbus	14001	500.0	FOURCORN	1	1	60.500
59.500	— — —	+	fbus	14003	500.0	NAVAJO	1	1	60.500
59.500	- - - - - - - -	*	fbul	14231	230.0	WESTWING	1	1	60.500
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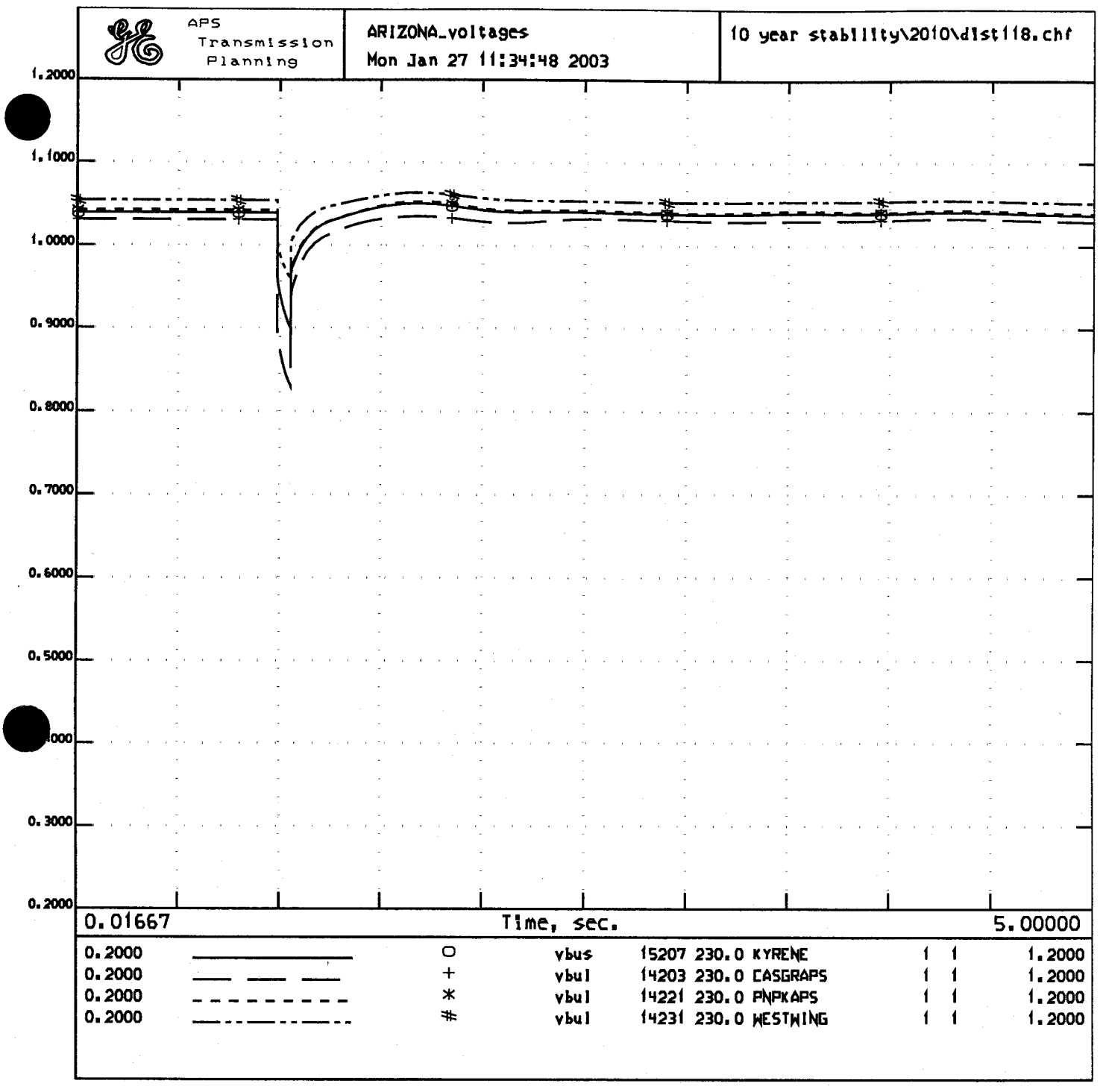
59.500	— — —	X	fbus	26048	500.0	MCCULLGH	1	1	60.500

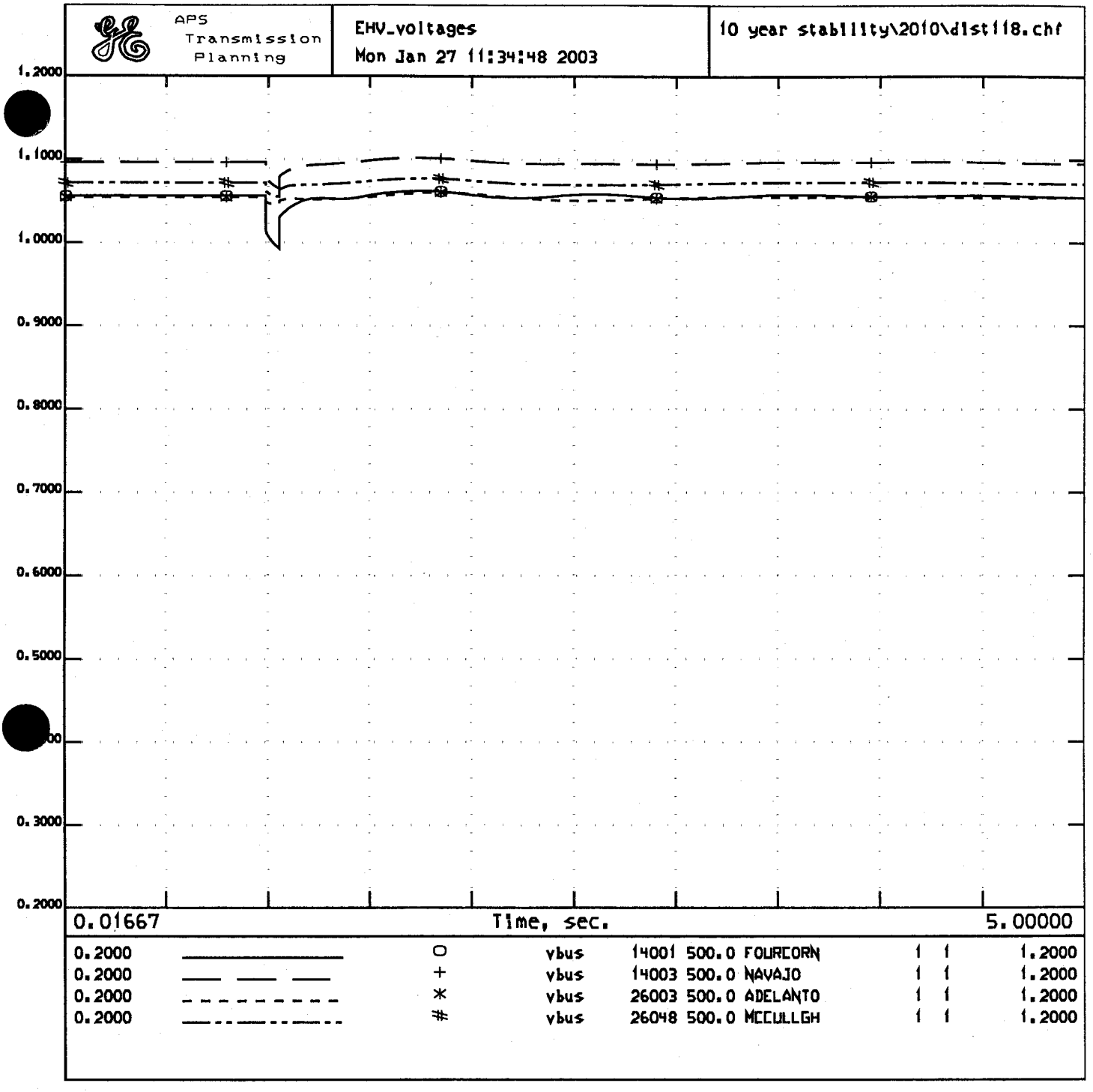
SILVERKING FLT CH-SK LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
CH-SK STAB :1; 01/03; T=0 3P FLT SKX500;
4C CLR FLT W/CH-SK;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



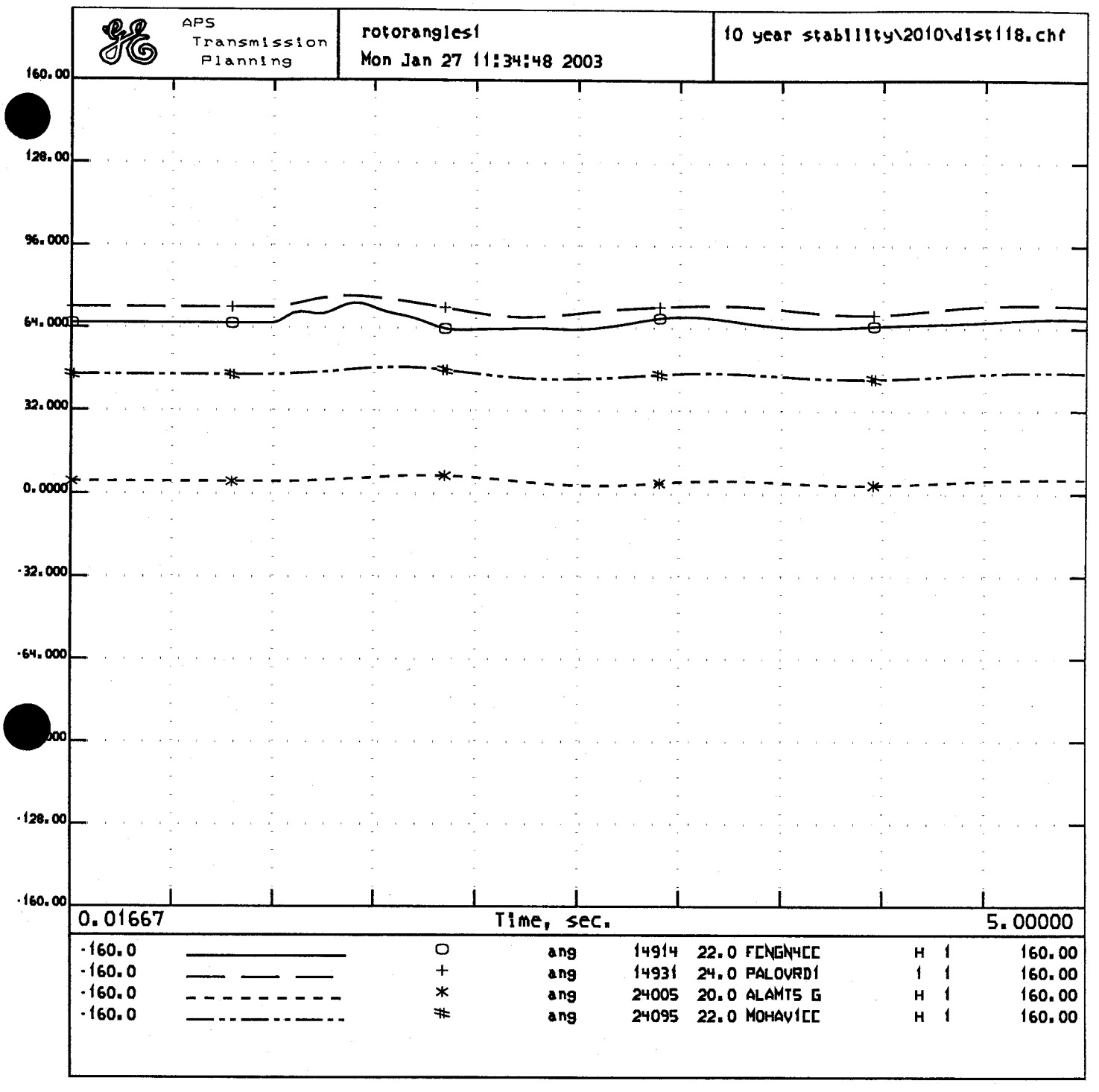
SILVERKING FLT SAG-SK LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
SAG-SK STAB #1; 01/03; T=0 3P FLT SKX500;
4C CLR FLT W/SAG-SK;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



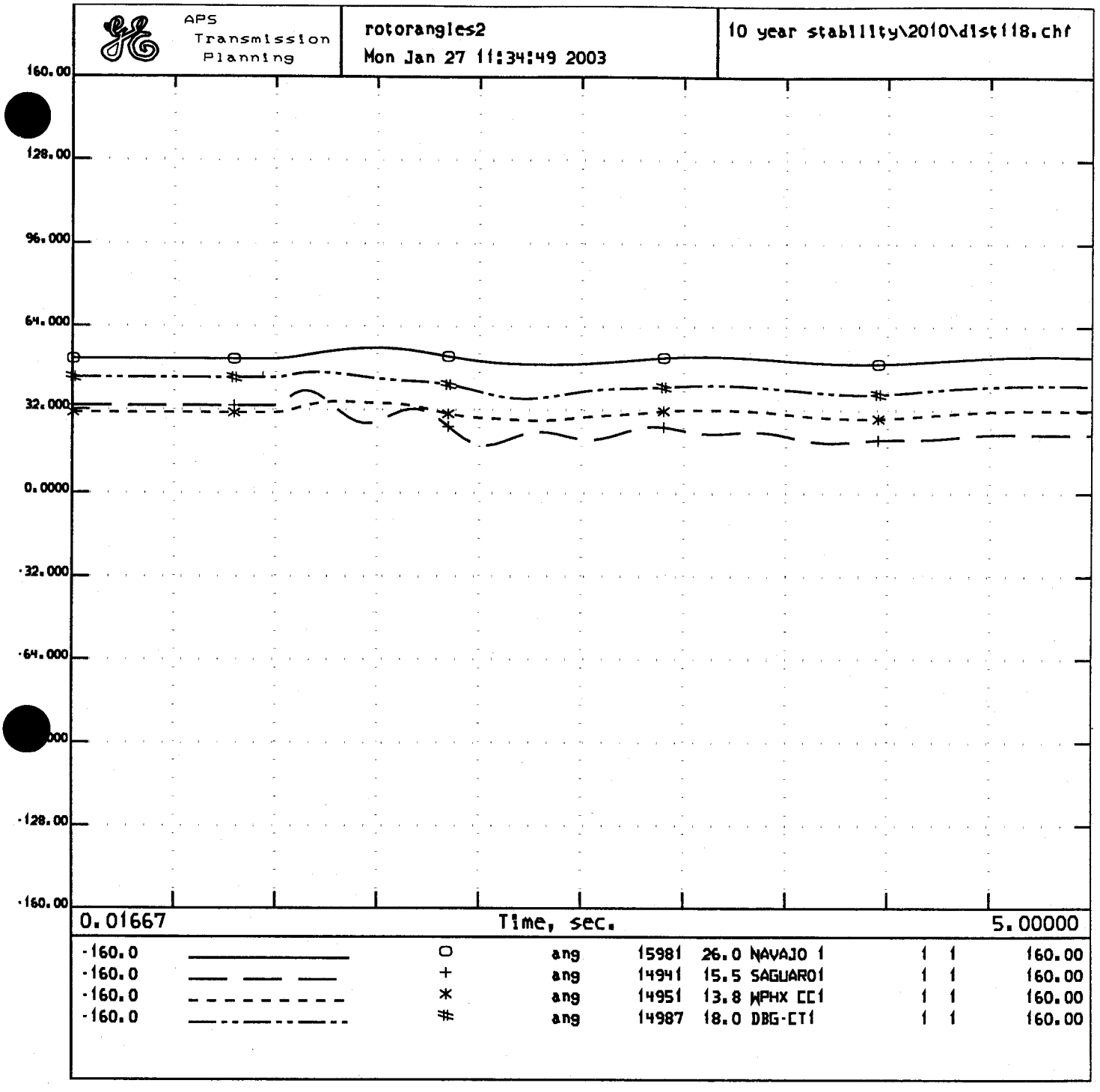
SILVERKING FLT SAG-SK LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
SAG-SK STAB #1; 01/03; T=0 3P FLT SKX500;
4C CLR FLT W/SAG-SK;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



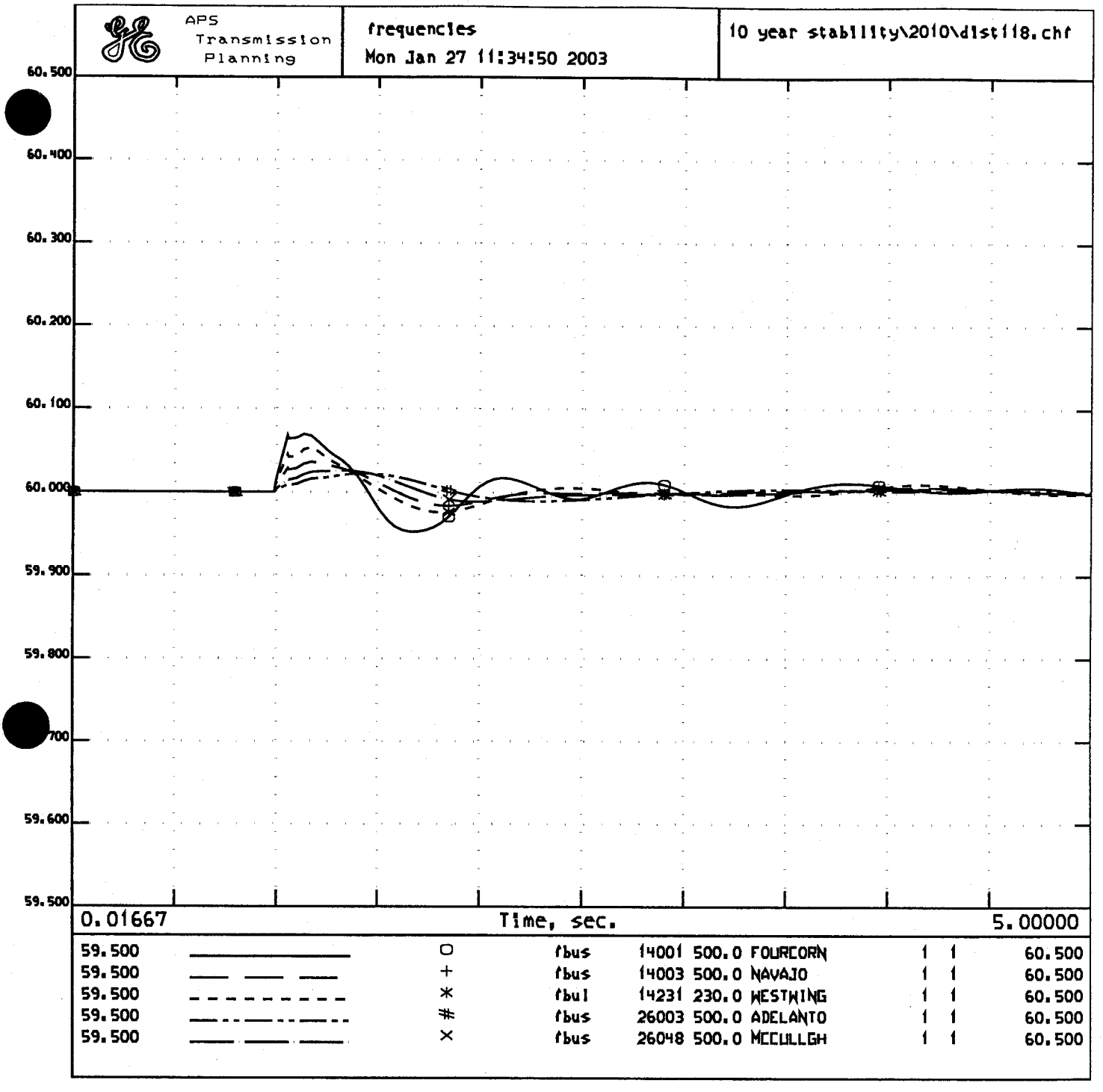
SILVERKING FLT SAG-SK LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
SAG-SK STAB #1; 01/03; T=0 3P FLT SKX500;
4C CLR FLT W/SAG-SK;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



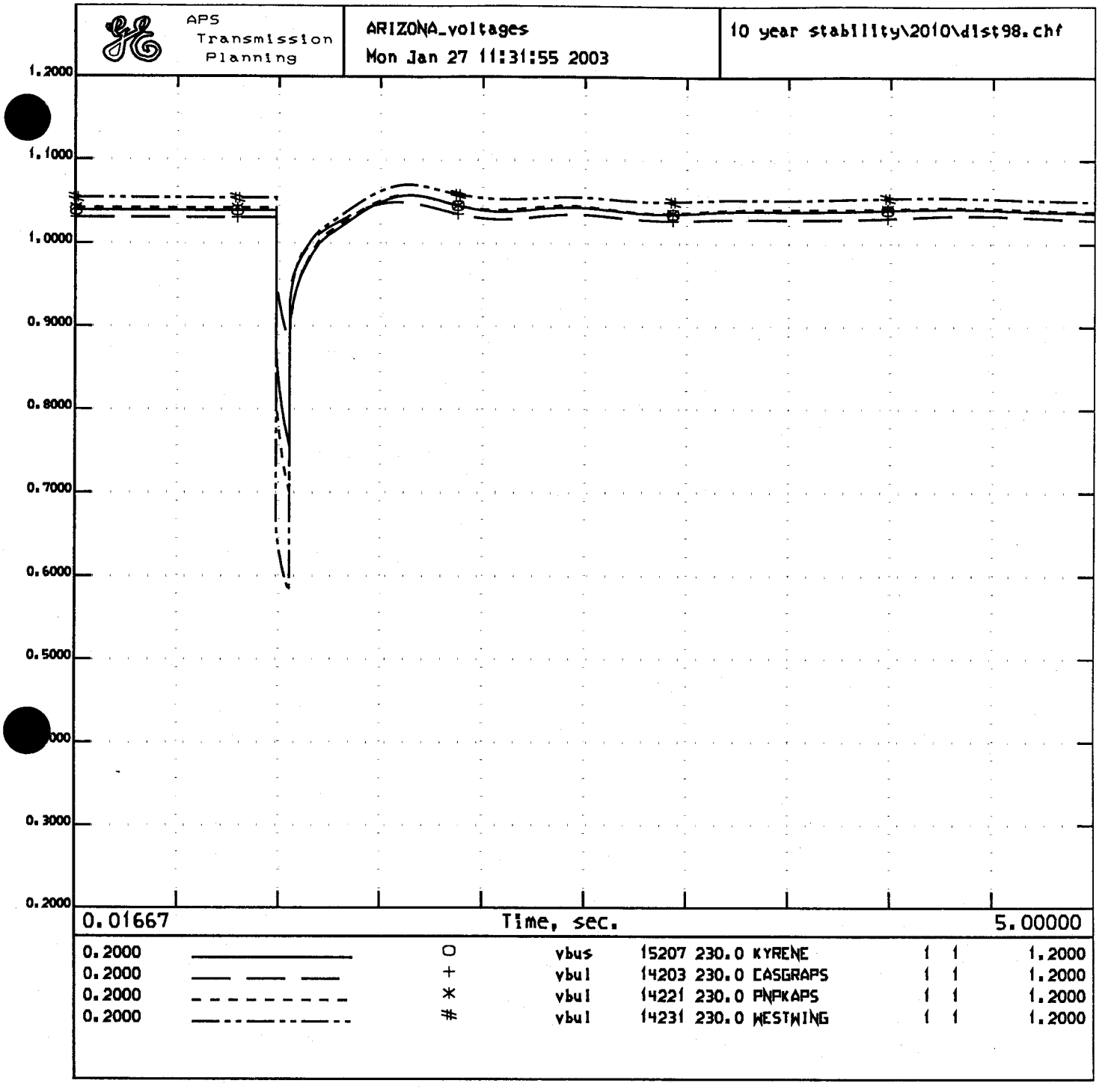
SILVERKING FLT SAG-SK LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
SAG-SK STAB #1; 01/03; T=0 3P FLT SKX500;
4C CLR FLT W/SAG-SK;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



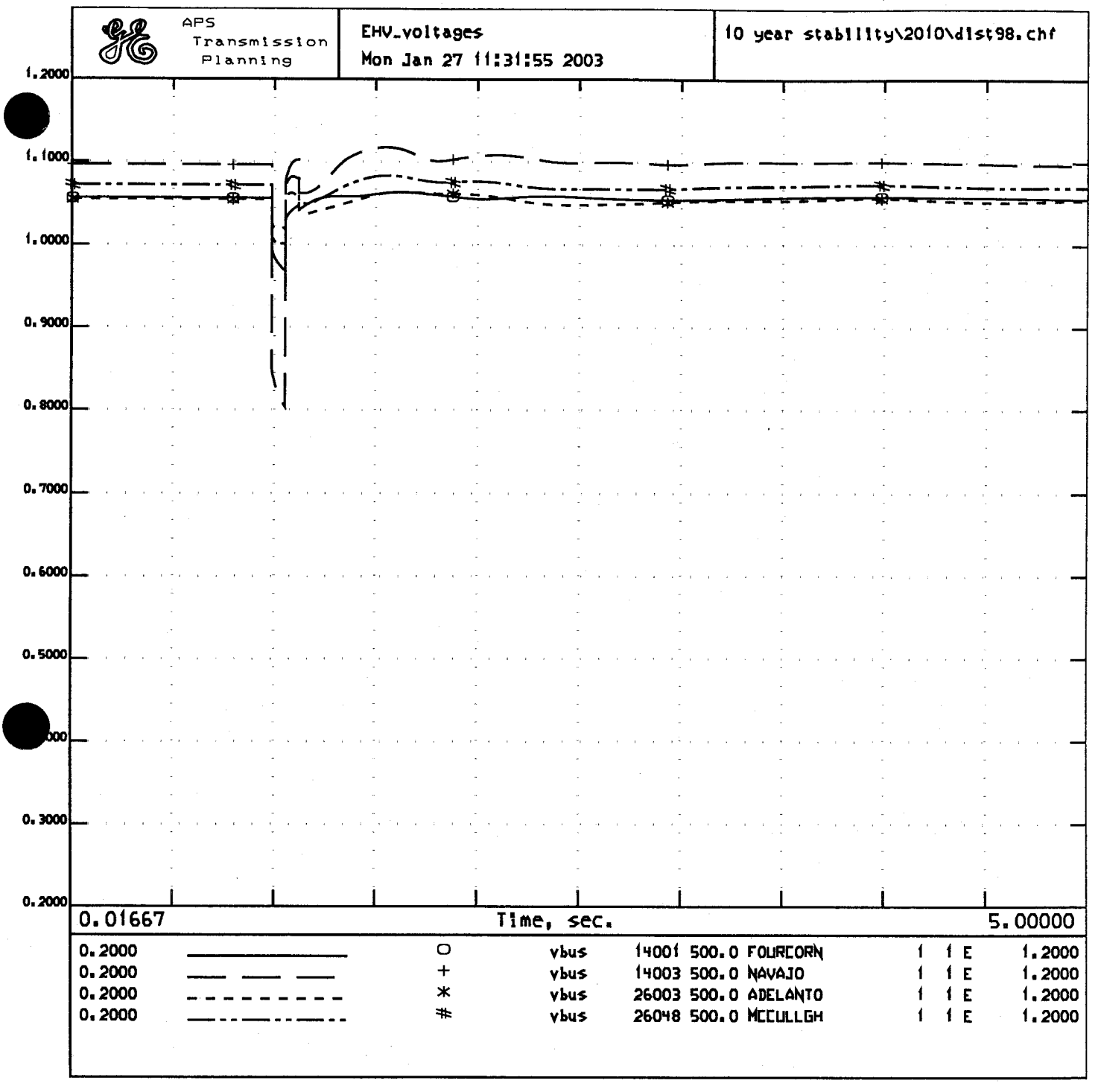
SILVERKING FLT SAG-SK LINE OUT
Originally the 2007 HSIA APPROVED BASE CASE
NOVEMBER 13, 2002
SAG-SK STAB #1; 01/03; T=0 3P FLT SKX500;
4C CLR FLT W/SAG-SK;2010.dyd;WSCC.bpt

Updated the system rep. to 2010.
Updated the loads to 2010 level.



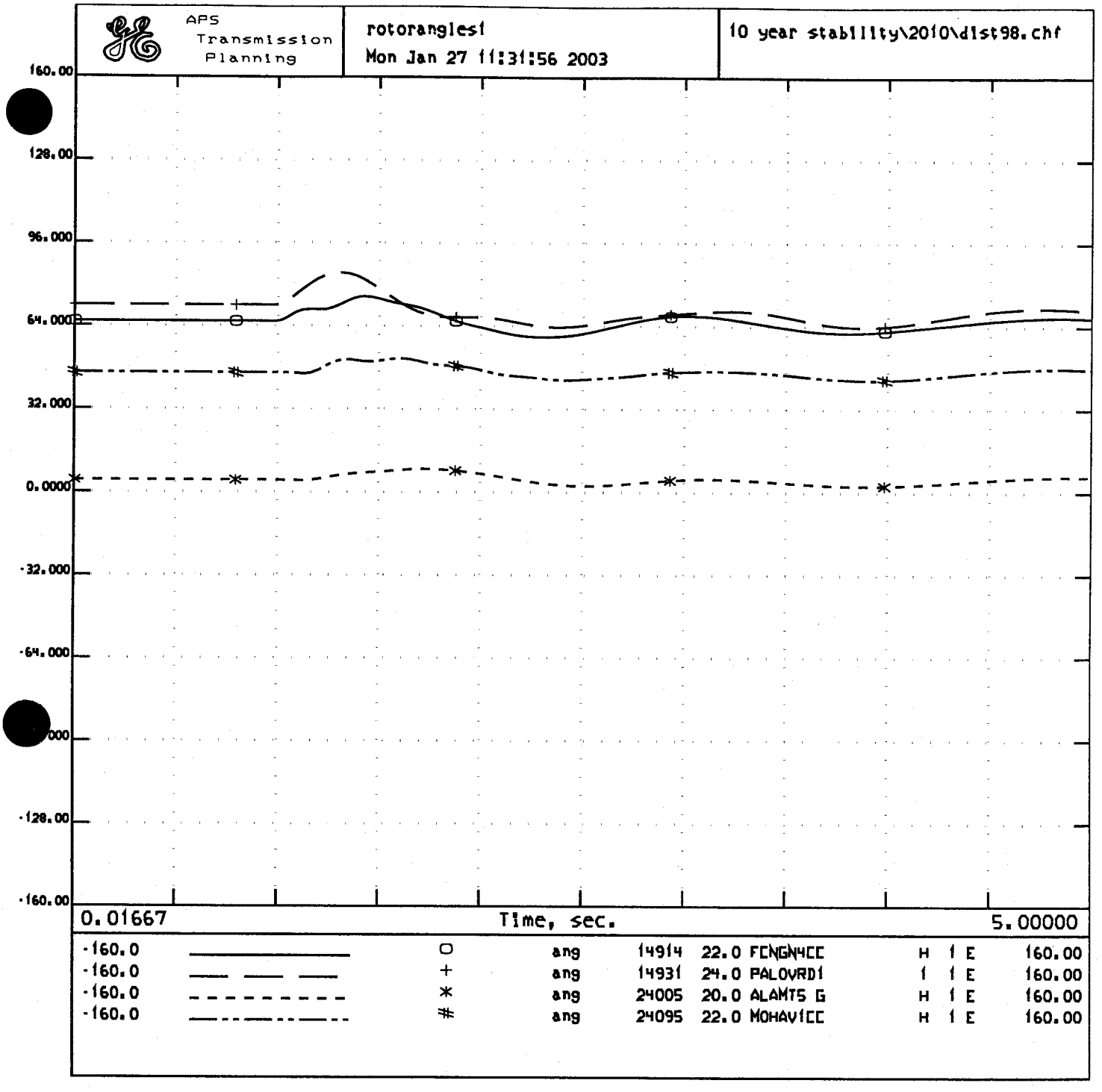
TM FLT NAV-TM LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
NAV-TM STAB; 1/03; T=0 3P FLT TM500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-TM;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



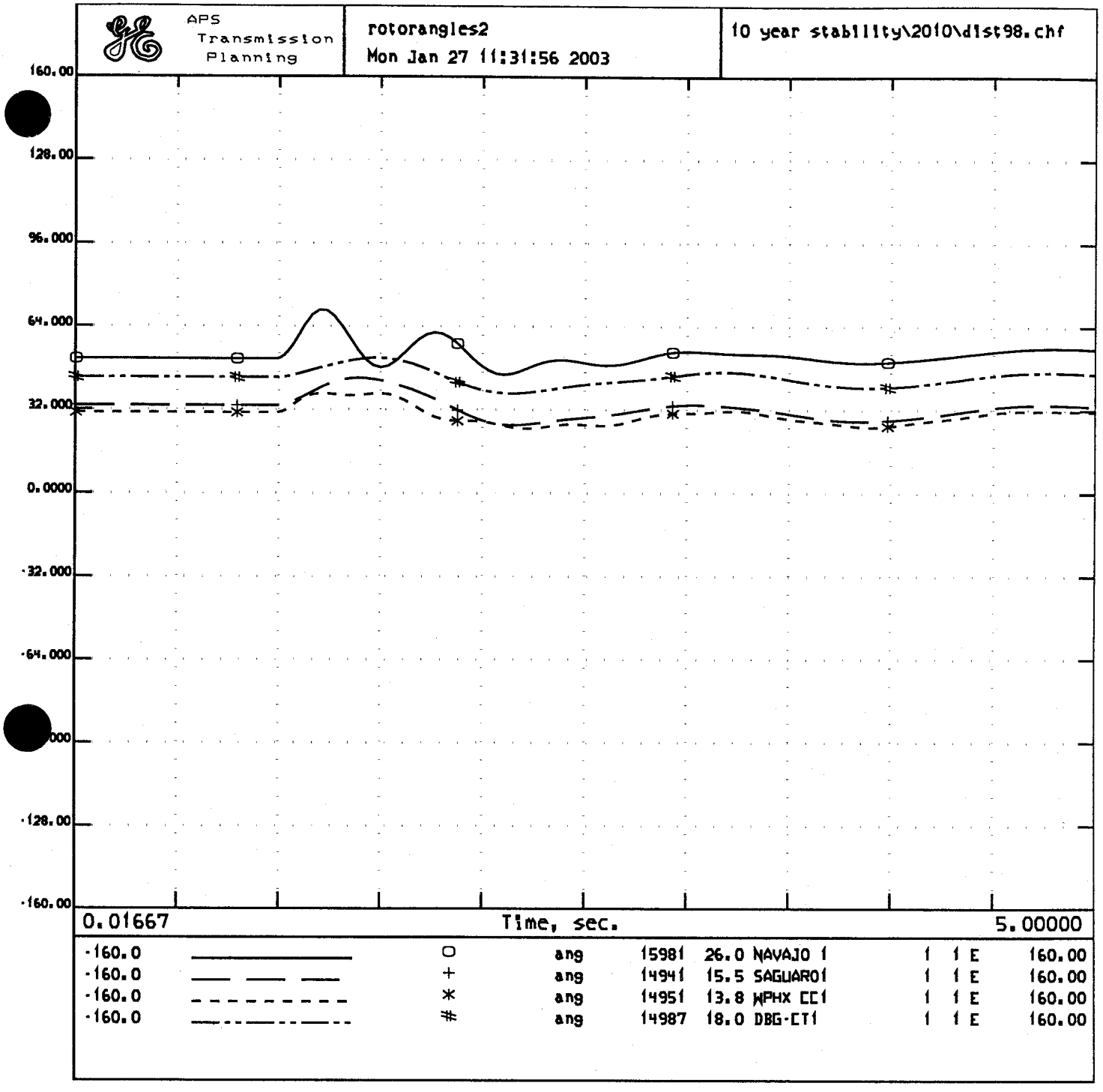
TM FLT NAV-TM LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
NAV-TM STAB; 1/03; T=0 3P FLT TM500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-TM;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



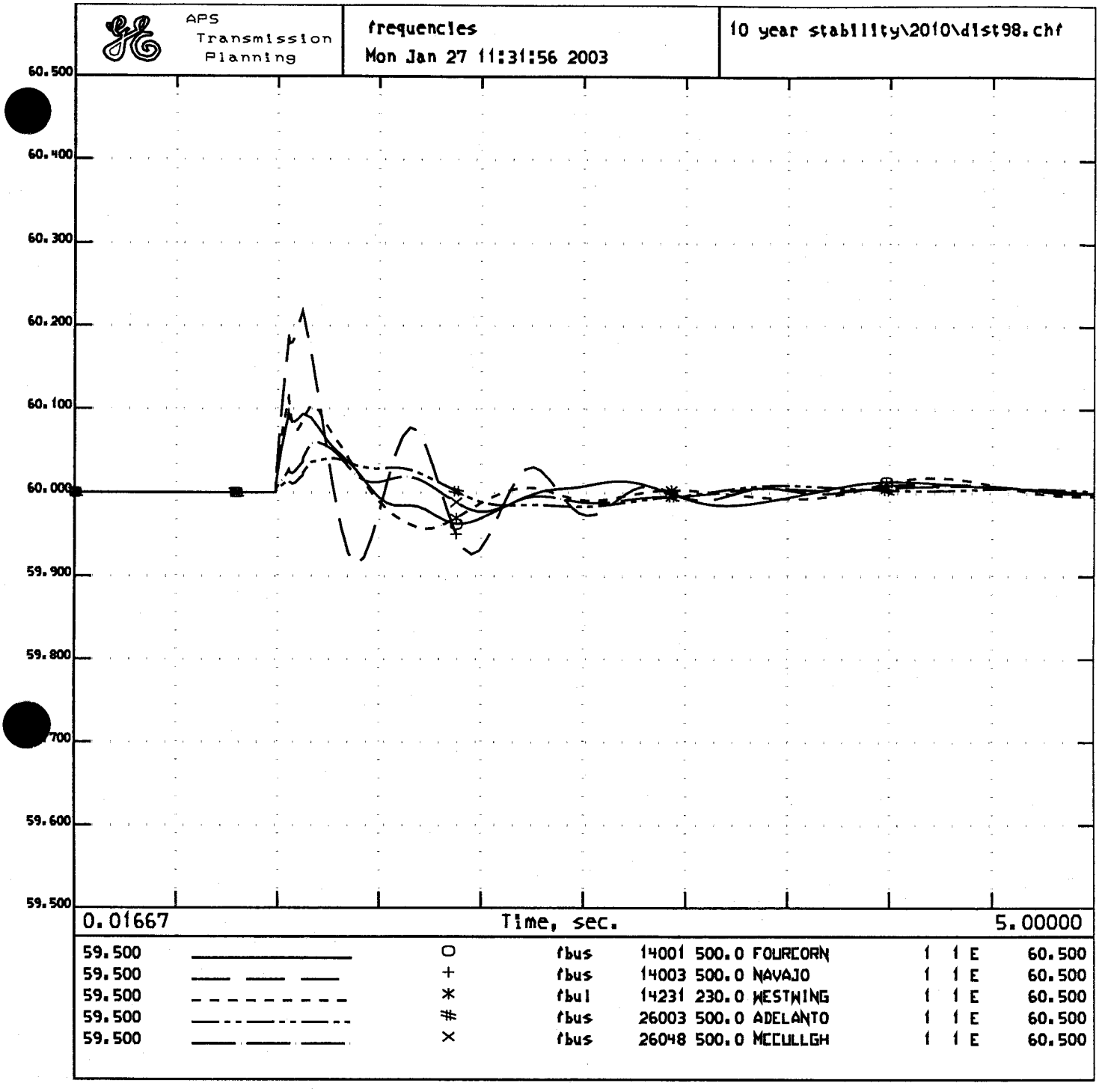
TM FLT NAV-TM LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
NAV-TM STAB; 1/03; T=0 3P FLT TM500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-TM;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



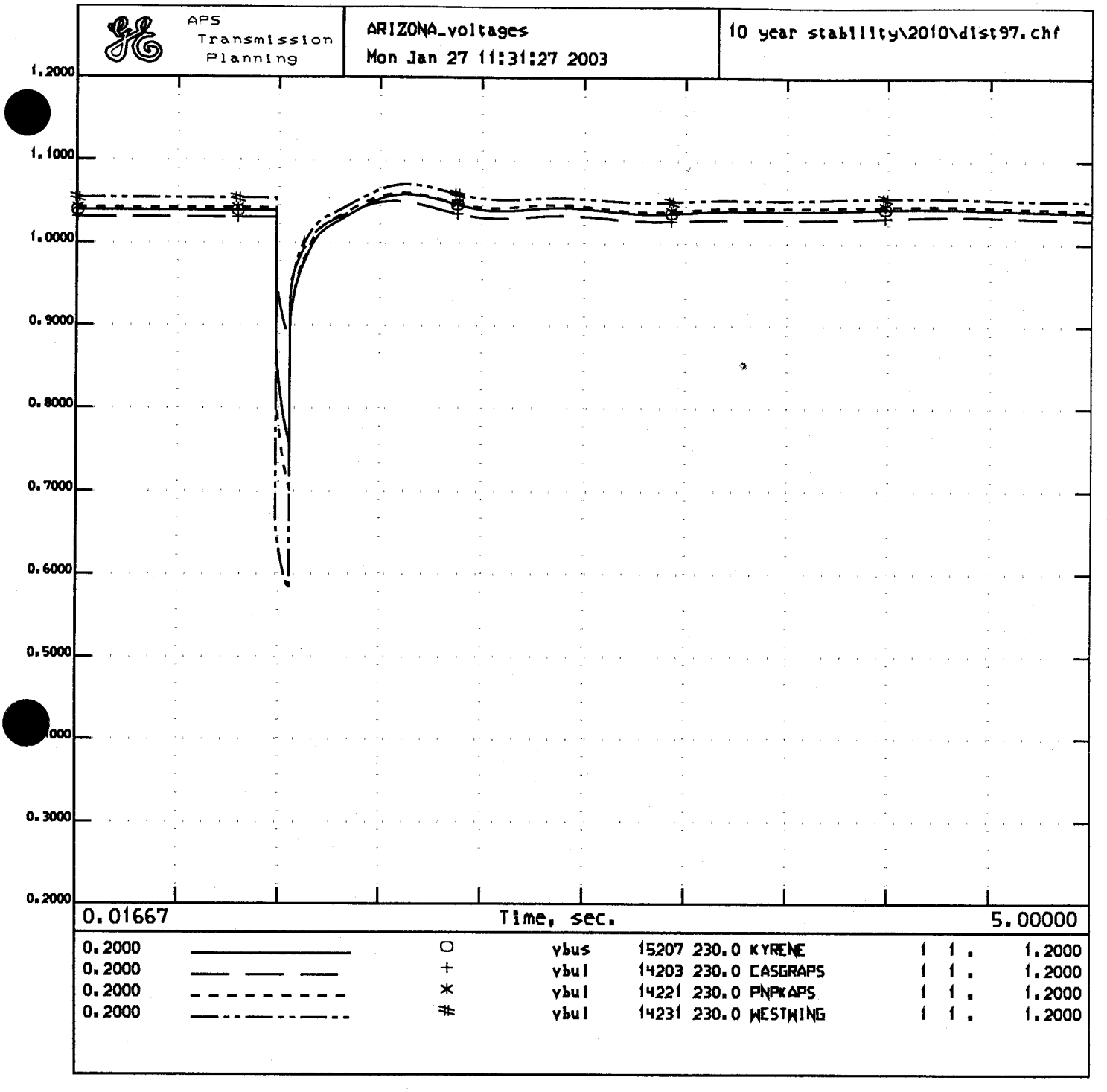
TM FLT NAV-TM LINE OUT
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
NAV-TM STAB; 1/03; T=0 3P FLT TM500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-TM;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



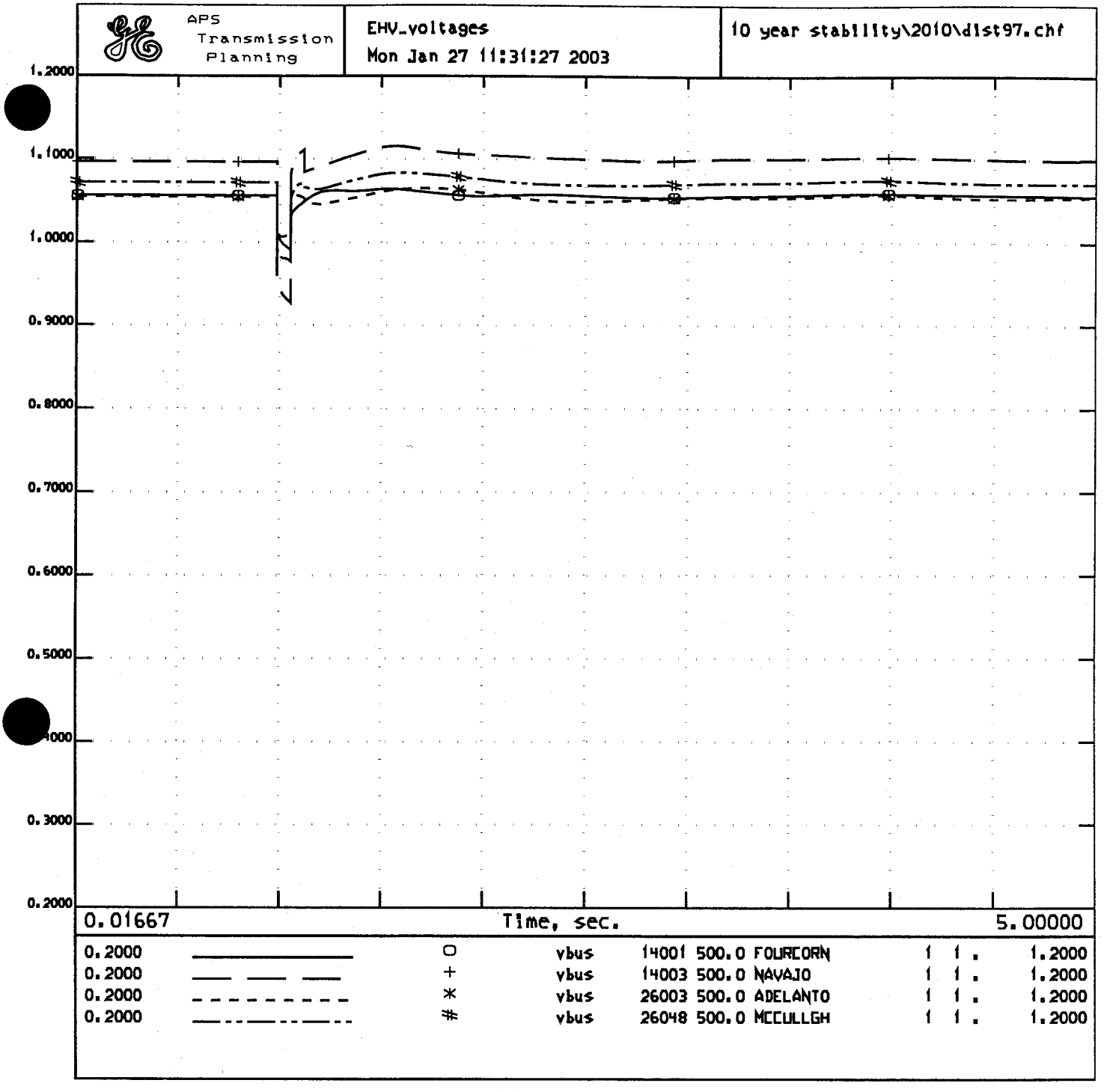
TM FLT NAV-TM LINE OUT
Originally the 2007 HSIA APPROVED BASE CASE
NOVEMBER 13, 2002
NAV-TM STAB; 1/03; T=0 3P FLT TM500; 6% FLT DMPING;FLSH CAPS
NAV-MCC/MKP,MKP-ELD;4C CLR FLT W/NAV-TM;8C REIN;2010.dyd;WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



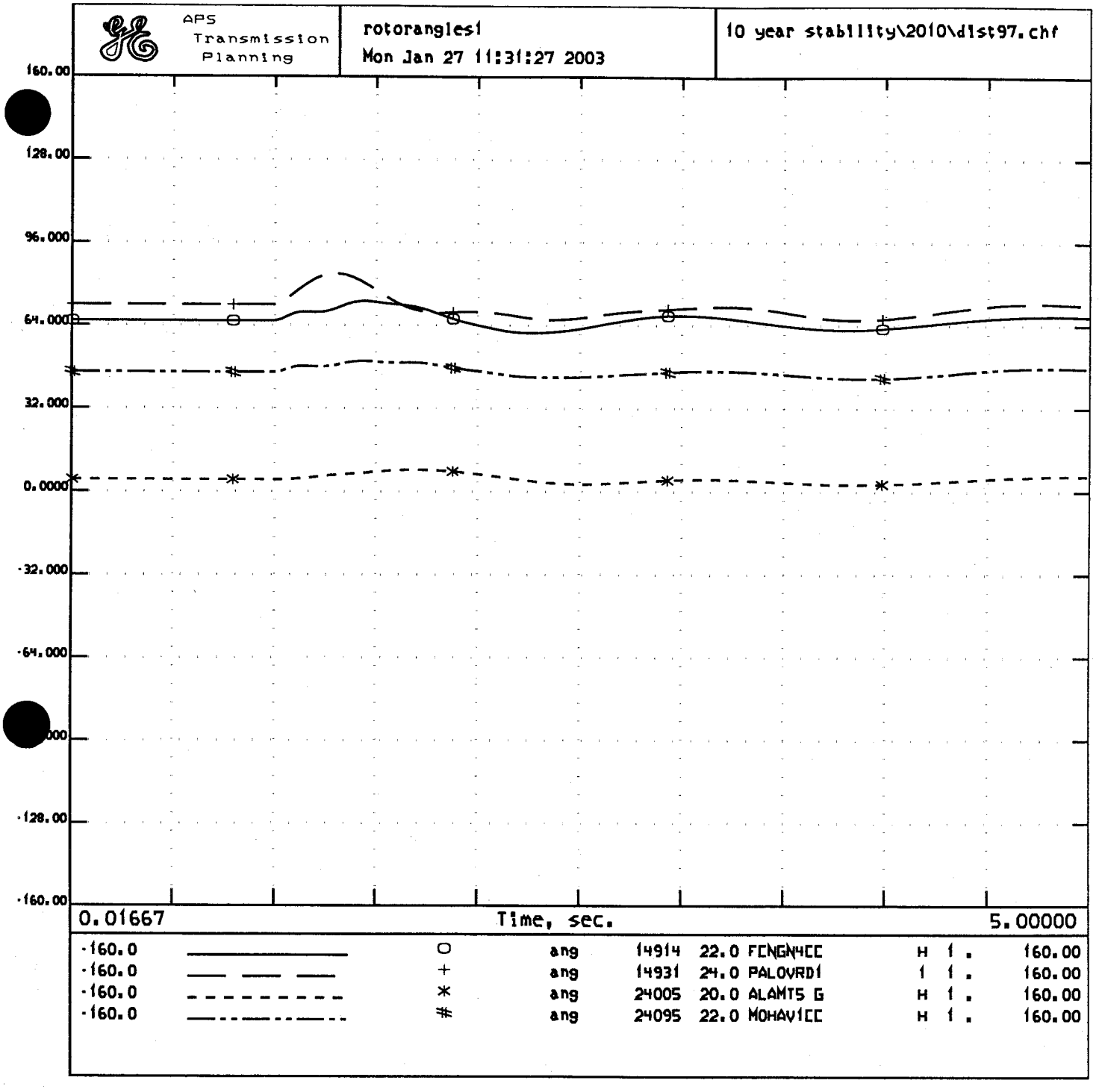
2010 Base Case for ACC 10-YR Stability Runs
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
WWG-TM STAB; 1/03; T=0 3P FLT TM500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MKP/WWG;4C CLR FLT W/WWG-TM;8C REIN;2010.dyd WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



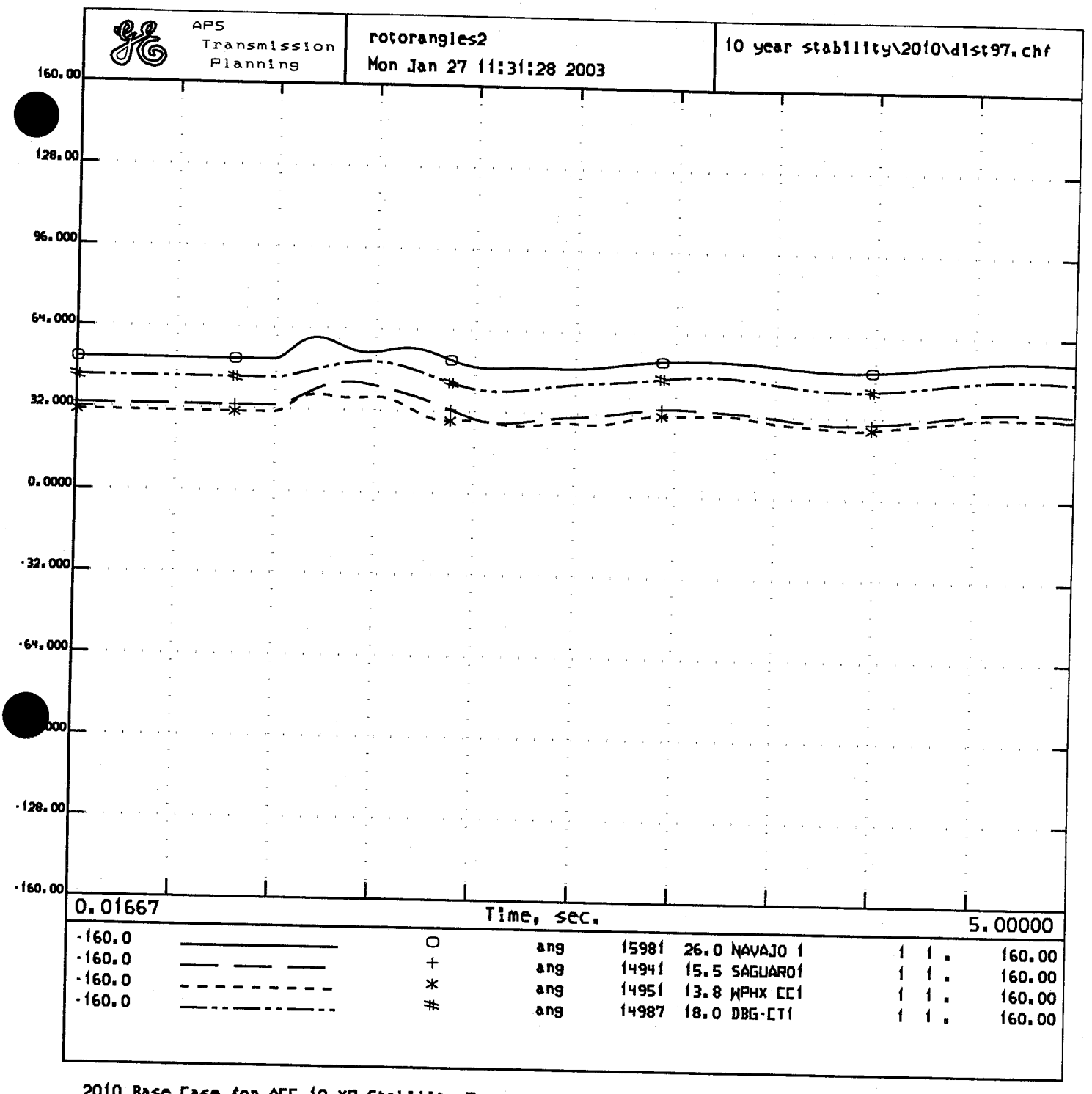
2010 Base Case for ACC 10-YR Stability Runs
Originally the 2007 HSIA APPROVED BASE CASE
NOVEMBER 13, 2002
WWG-TM STAB; 1/03; T=0 3P FLT TM500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MKP/WWG;4C CLR FLT W/WWG-TM;8C REIN;2010.dyd WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



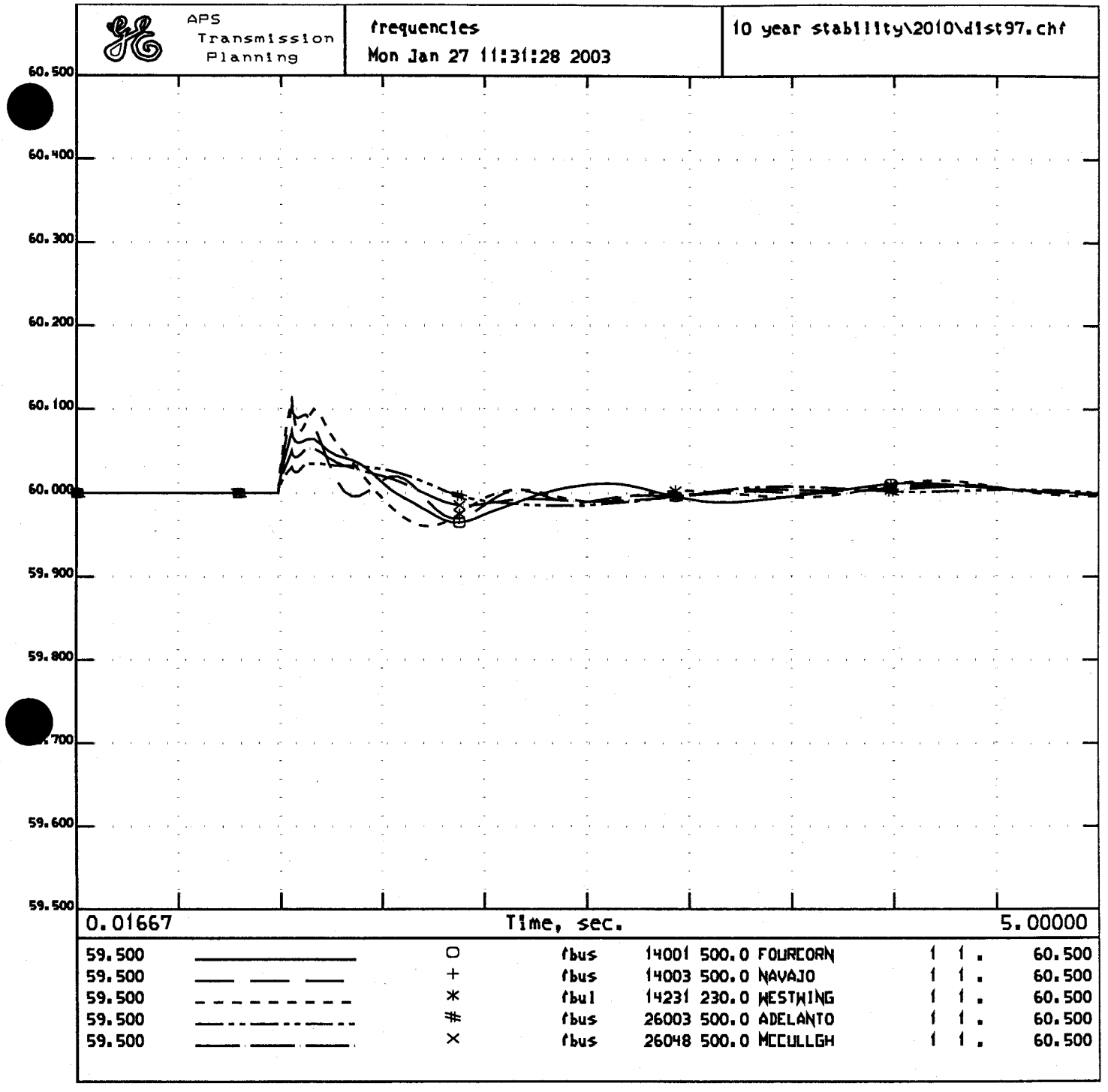
2010 Base Case for ACC 10-YR Stability Runs
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
WWG-TM STAB; 1/03; T=0 3P FLT TM500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MKP/WWG;4C CLR FLT W/WWG-TM;8C REIN;2010.dyd WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



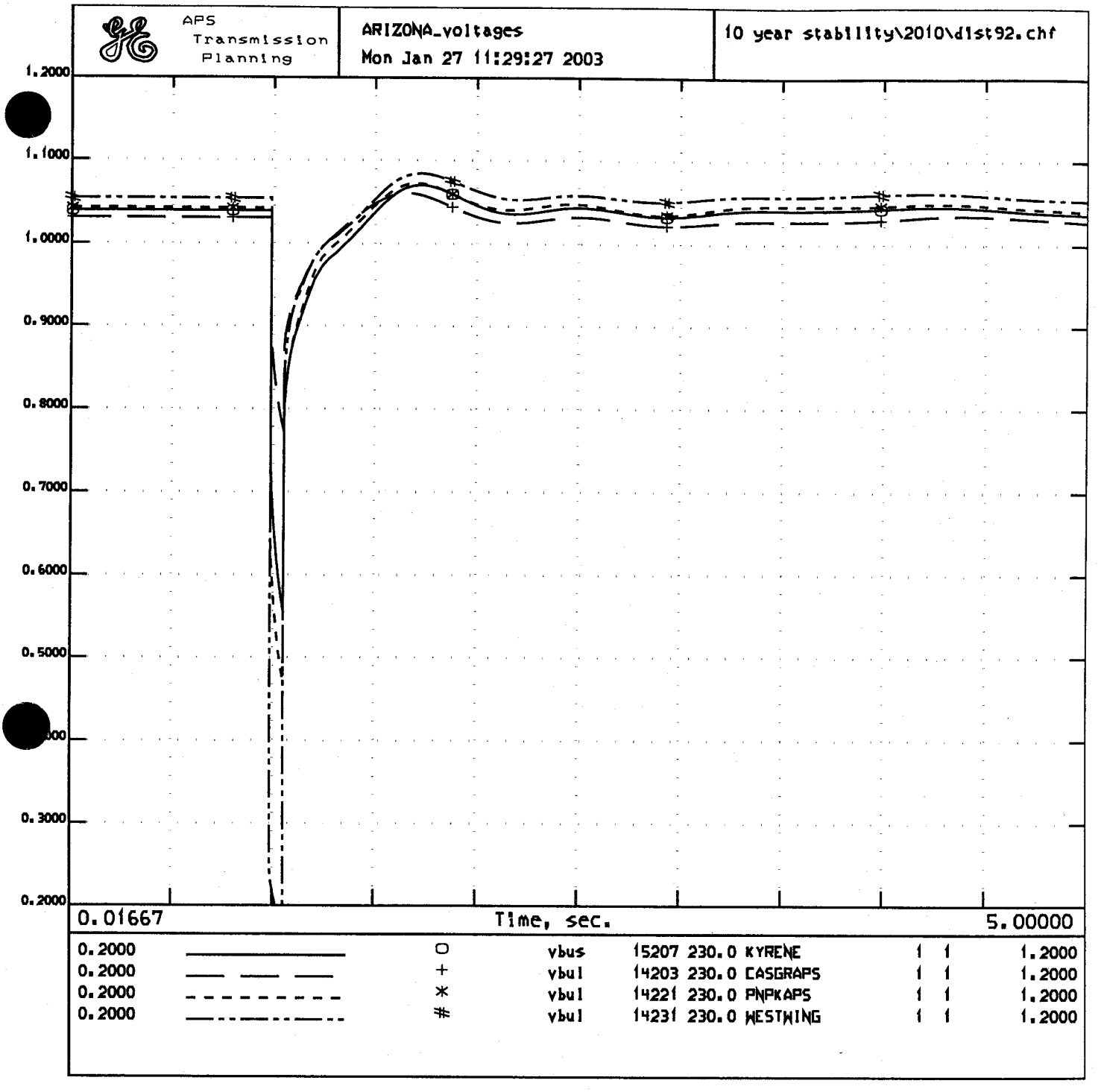
2010 Base Case for ACC 10-YR Stability Runs
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
WWG-TM STAB; 1/03; T=0 3P FLT TM500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MKP/WWG;4C CLR FLT W/WWG-TM;8C REIN;2010.dyd WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



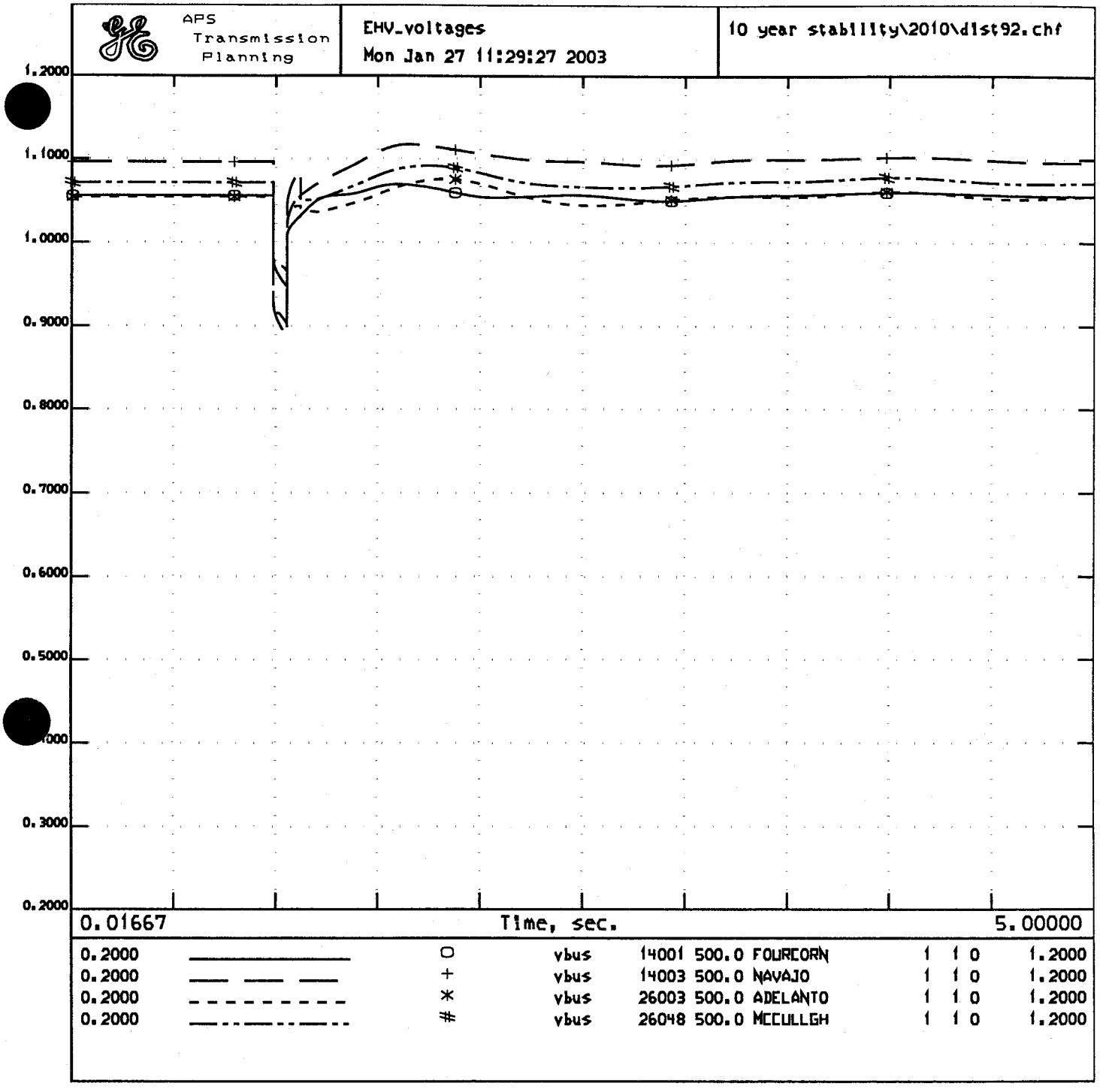
2010 Base Case for ACC 10-YR Stability Runs
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
WWG-TM STAB; 1/03; T=0 3P FLT TM500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MKP/WWG;4C CLR FLT W/WWG-TM;8C REIN;2010.dyd WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



2010 Base Case for ACC 10-YR Stability Runs
Originally the 2007 HS1A APPROVED BASE CASE
NOVEMBER 13, 2002
WWG-YAV STAB; 1/03; T=0 3P FLT WWG500;FLSH CAPS MKP-YAV/YAV-WWG,
NAV-MKP/WWG;4C CLR FLT W/WWG-PAL;8C REIN;2010.dyd WSCC.bat

Updated the system rep. to 2010.
Updated the loads to 2010 level.



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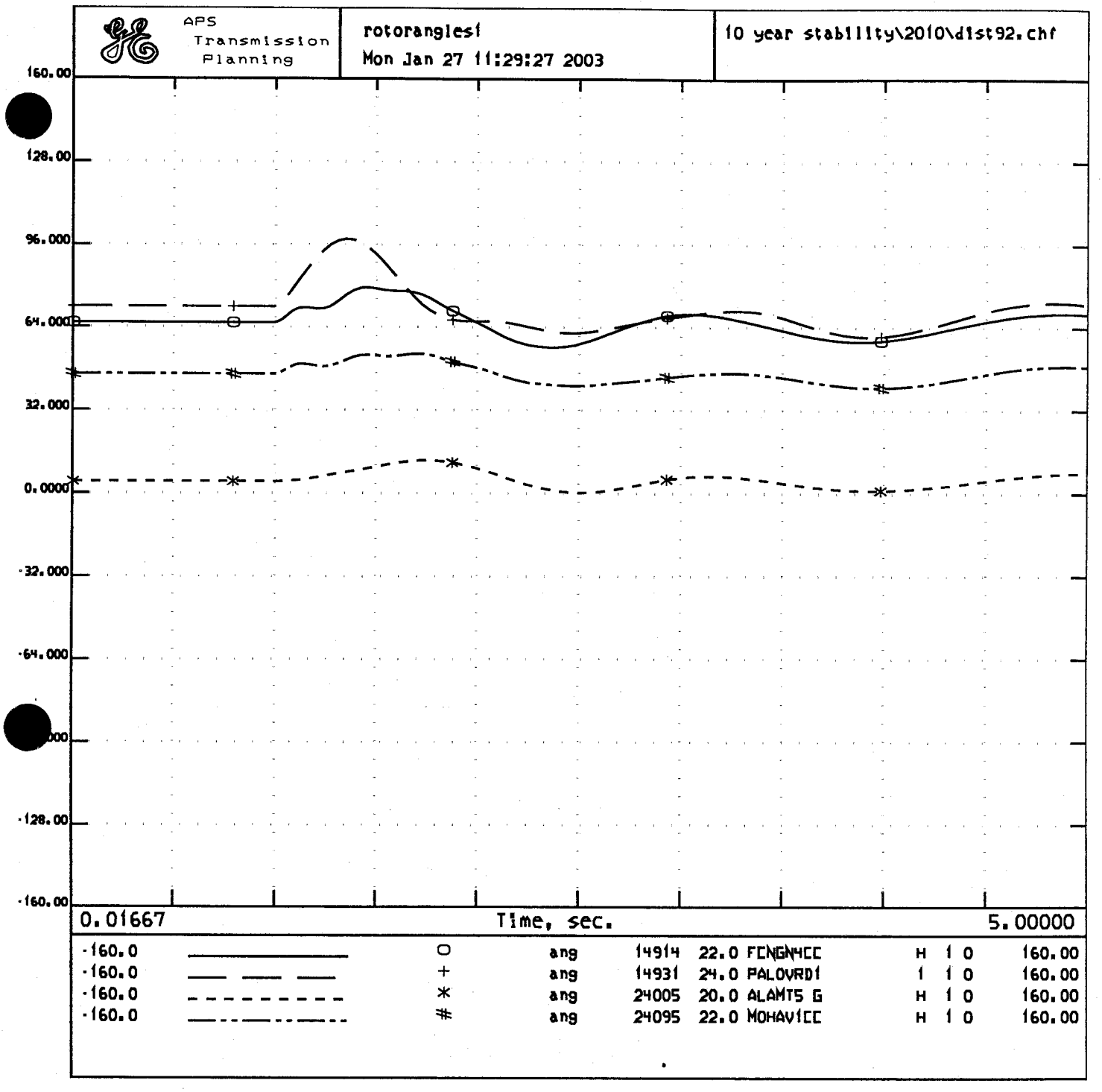

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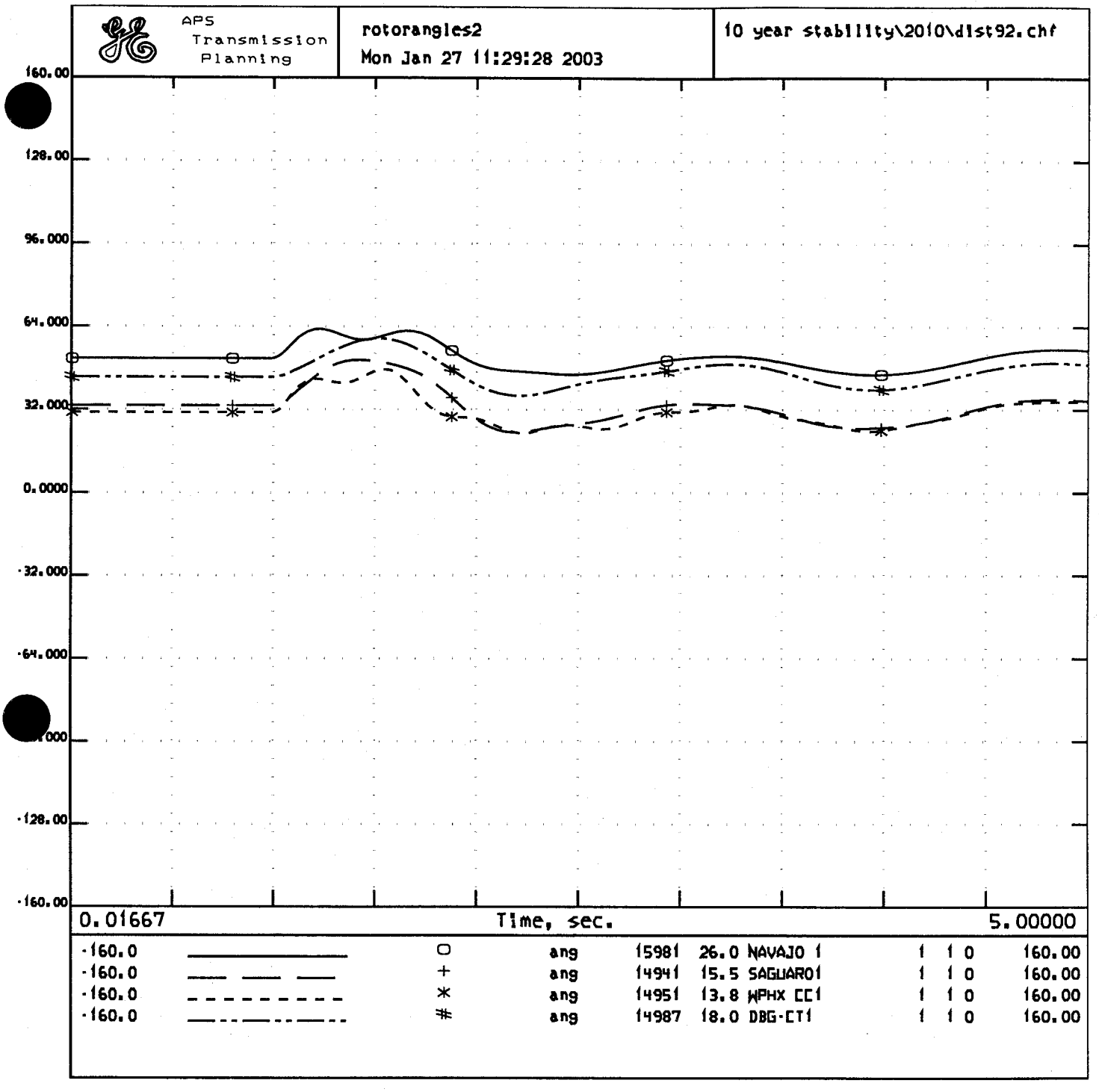

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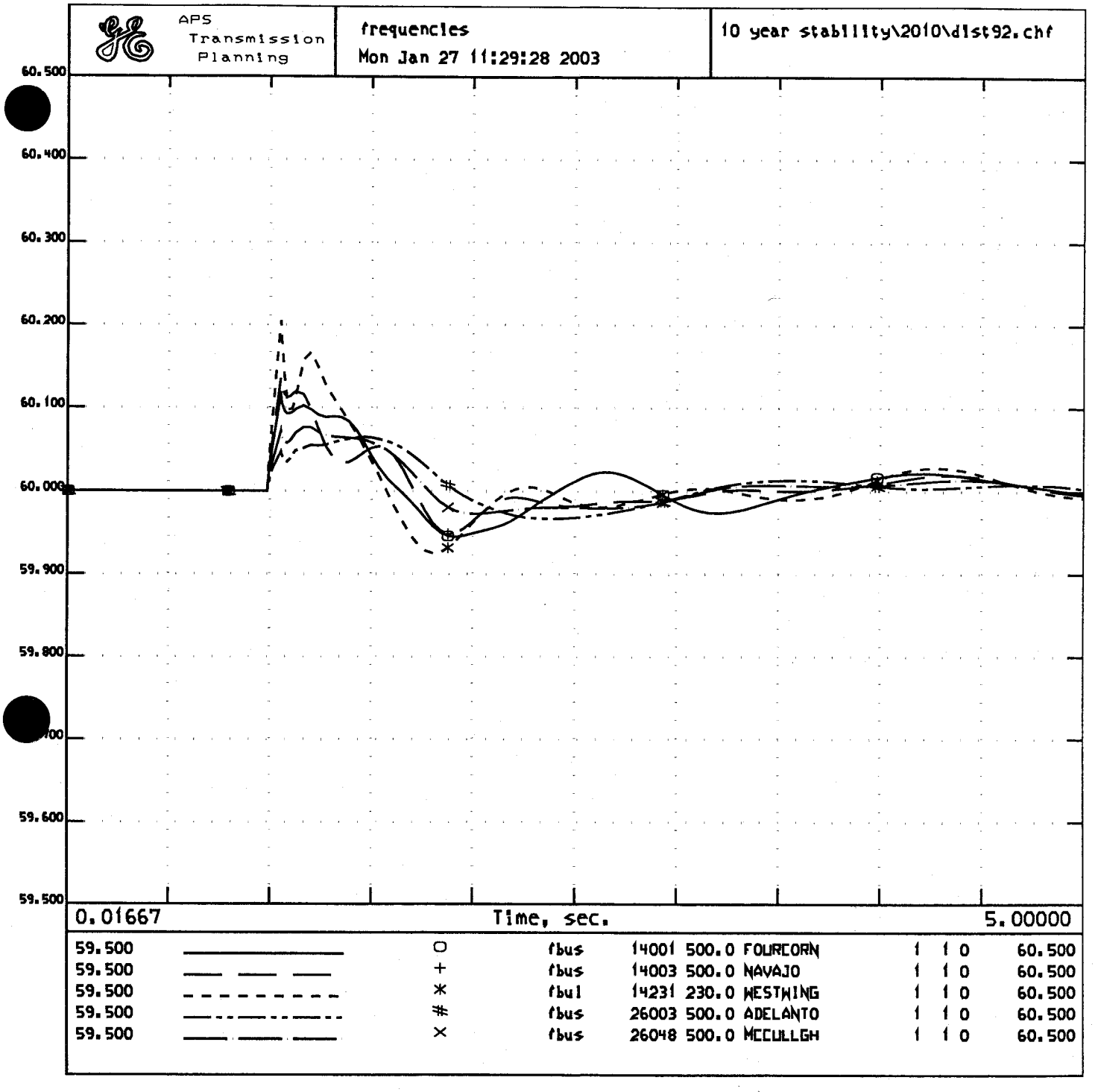

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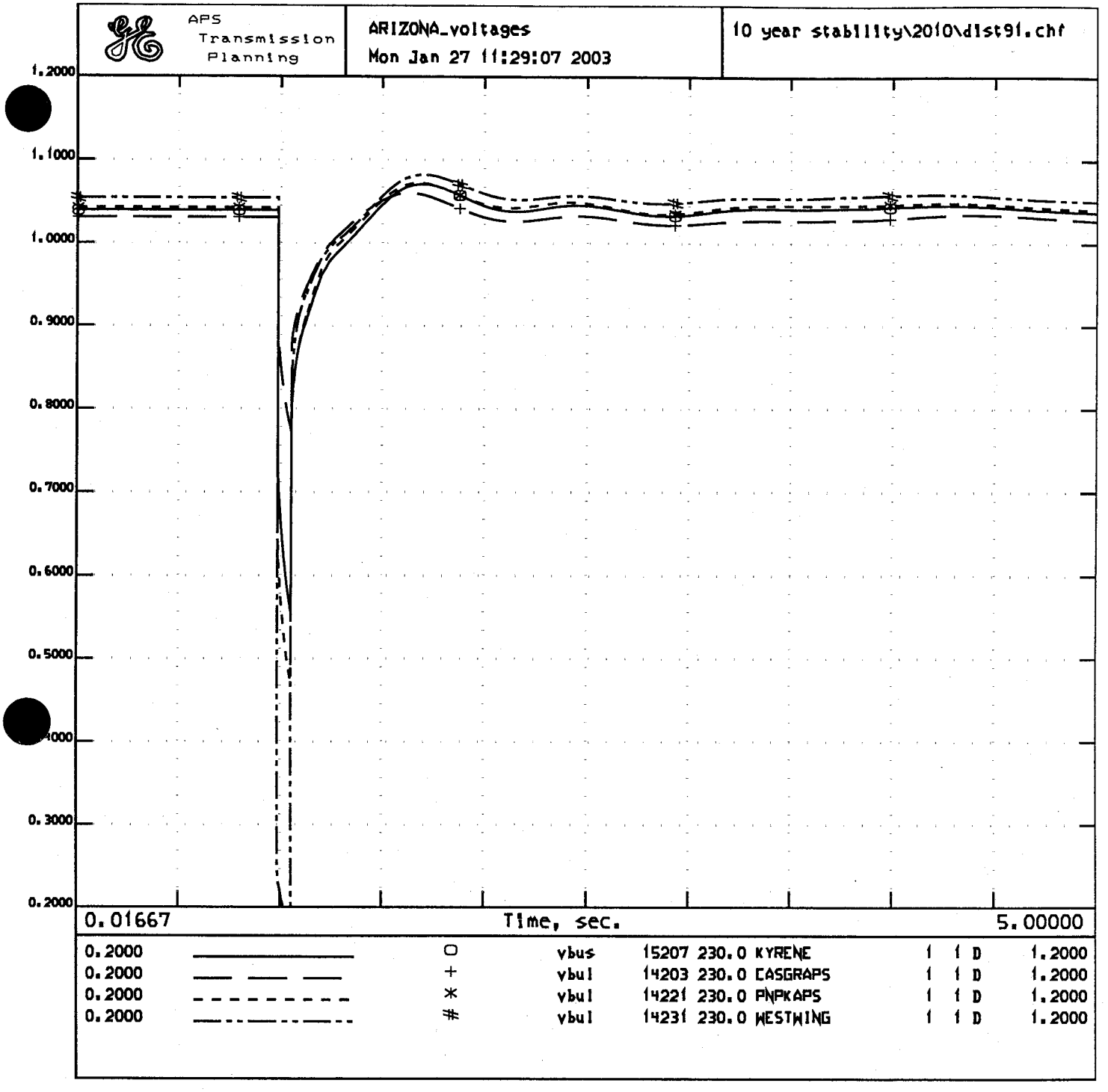

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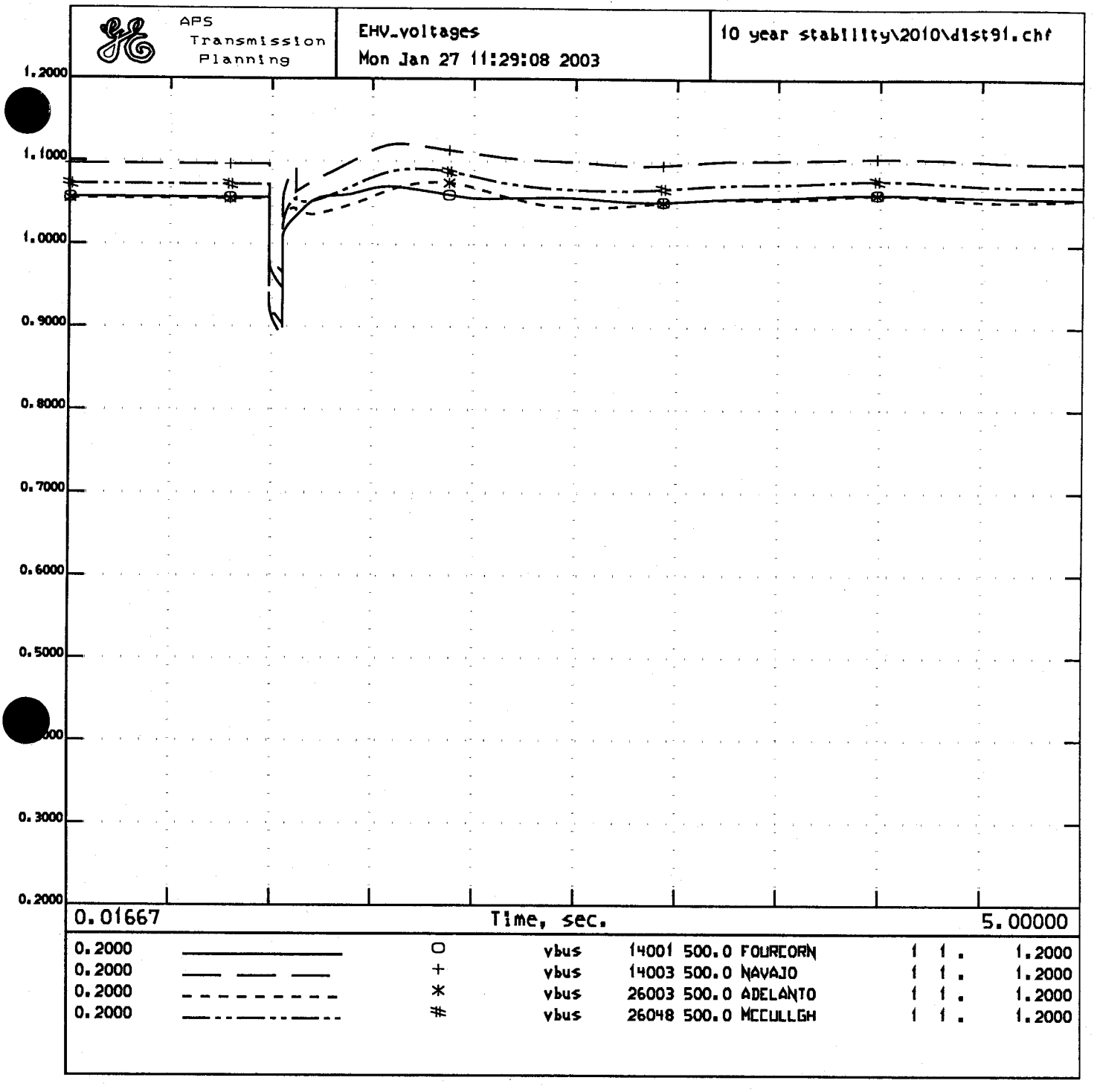

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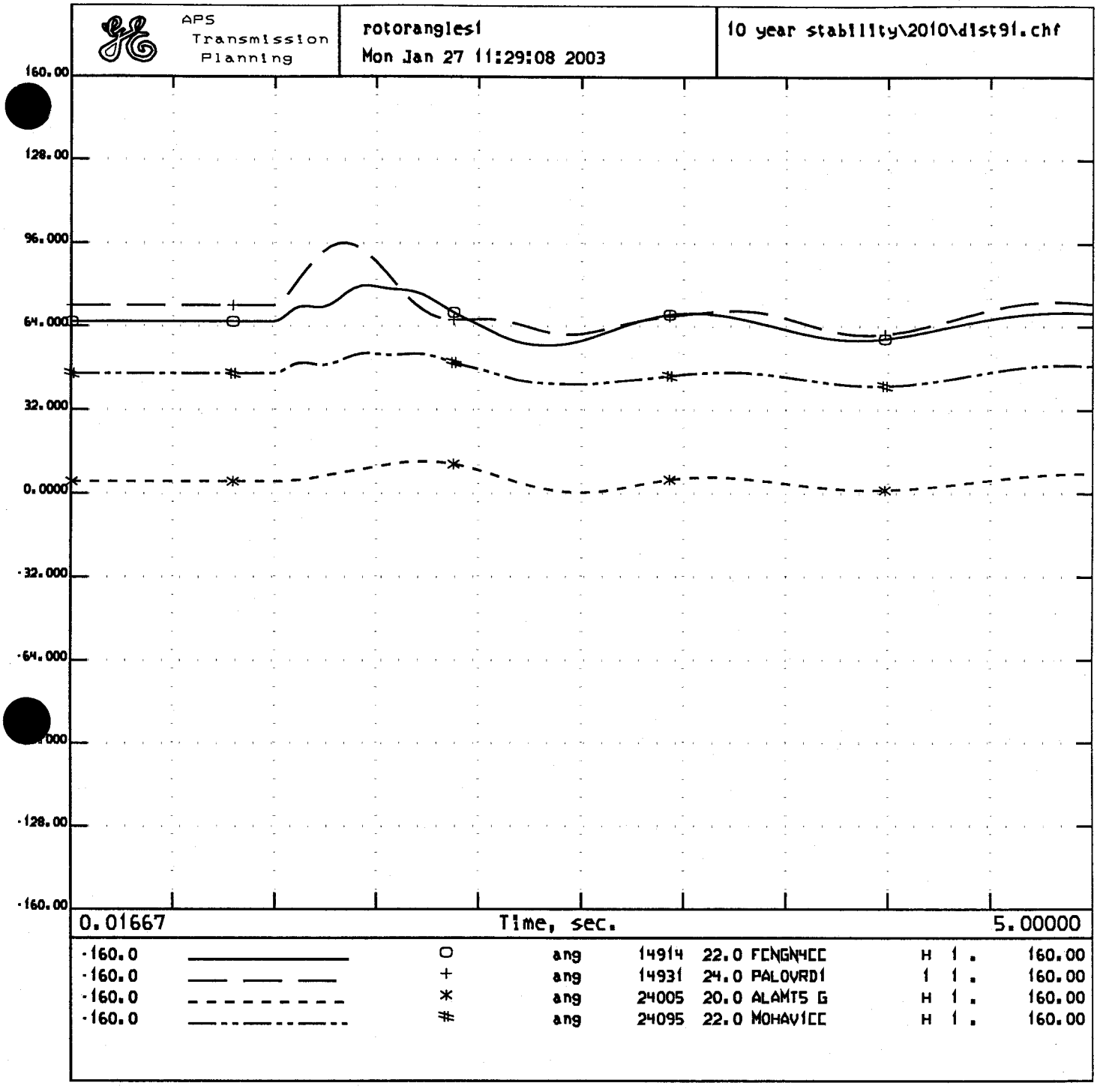

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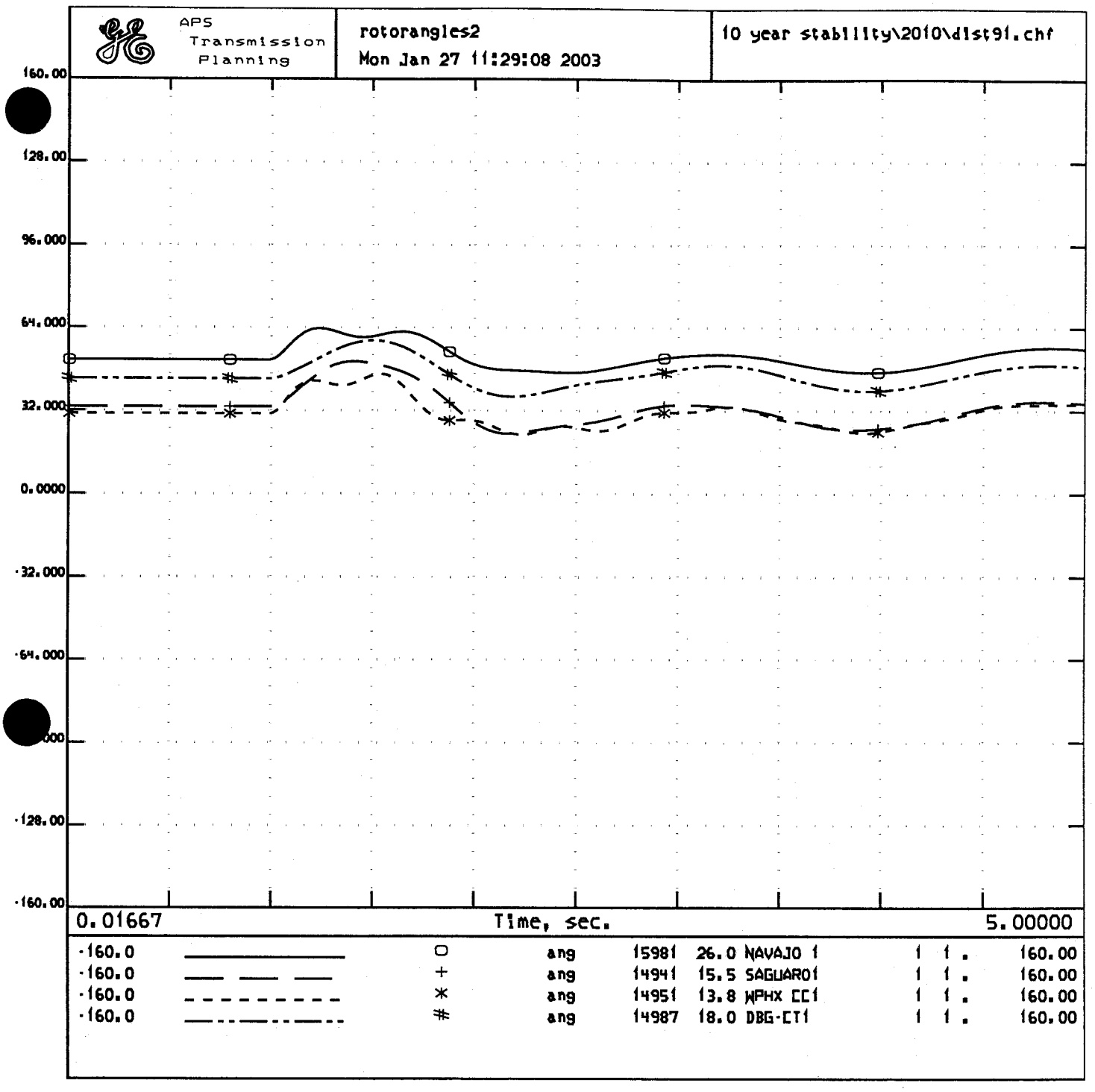

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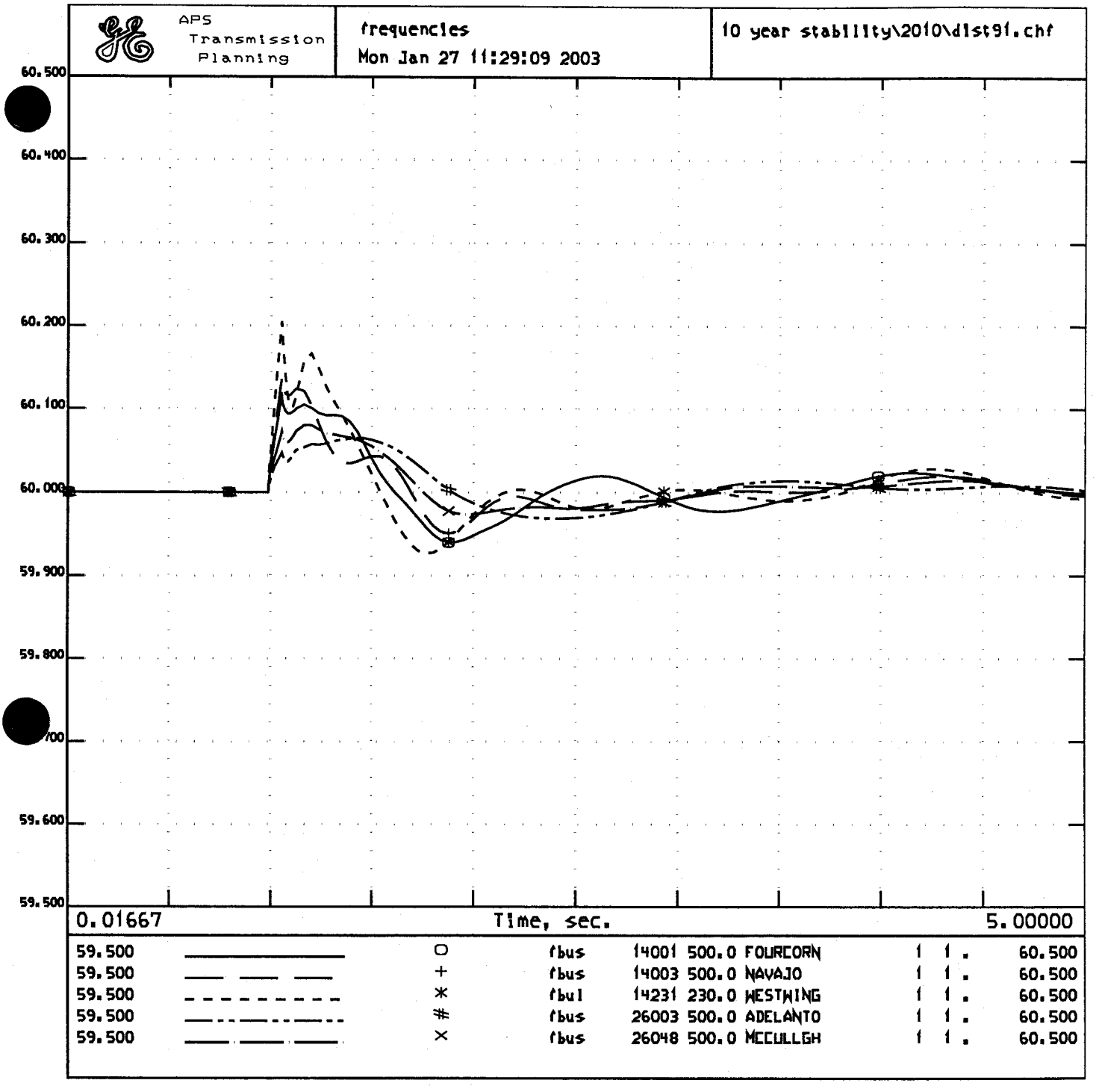

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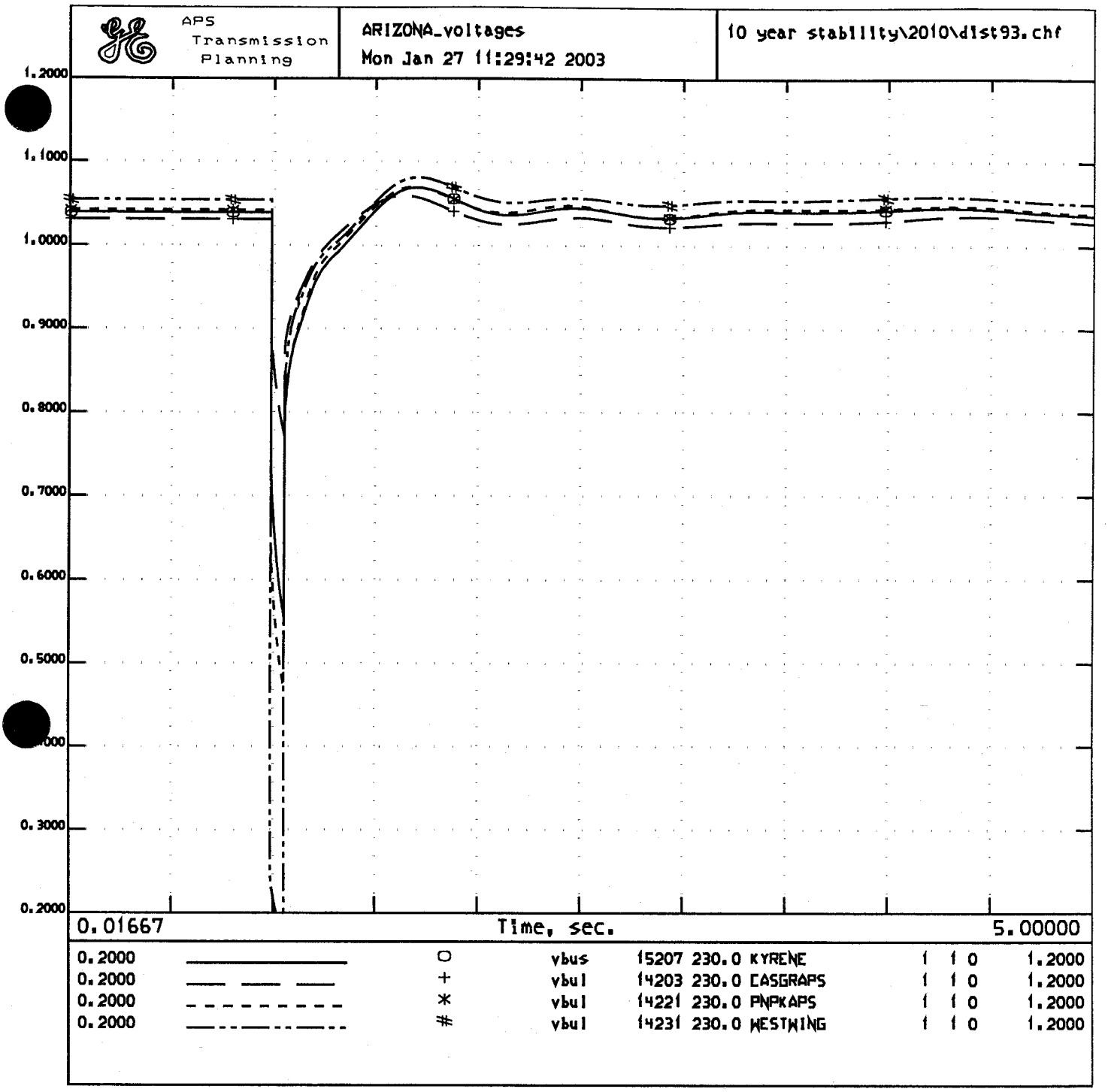

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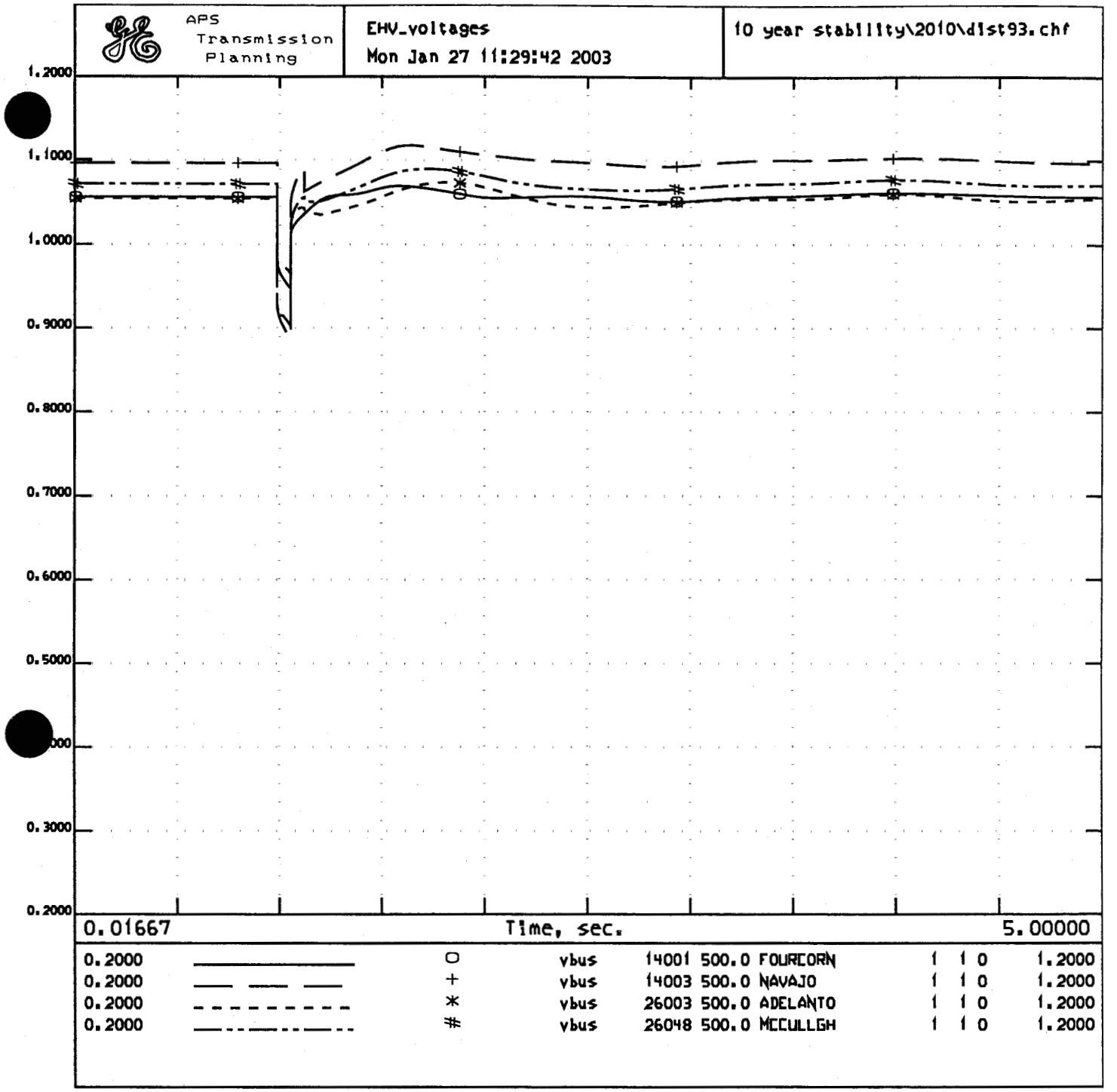

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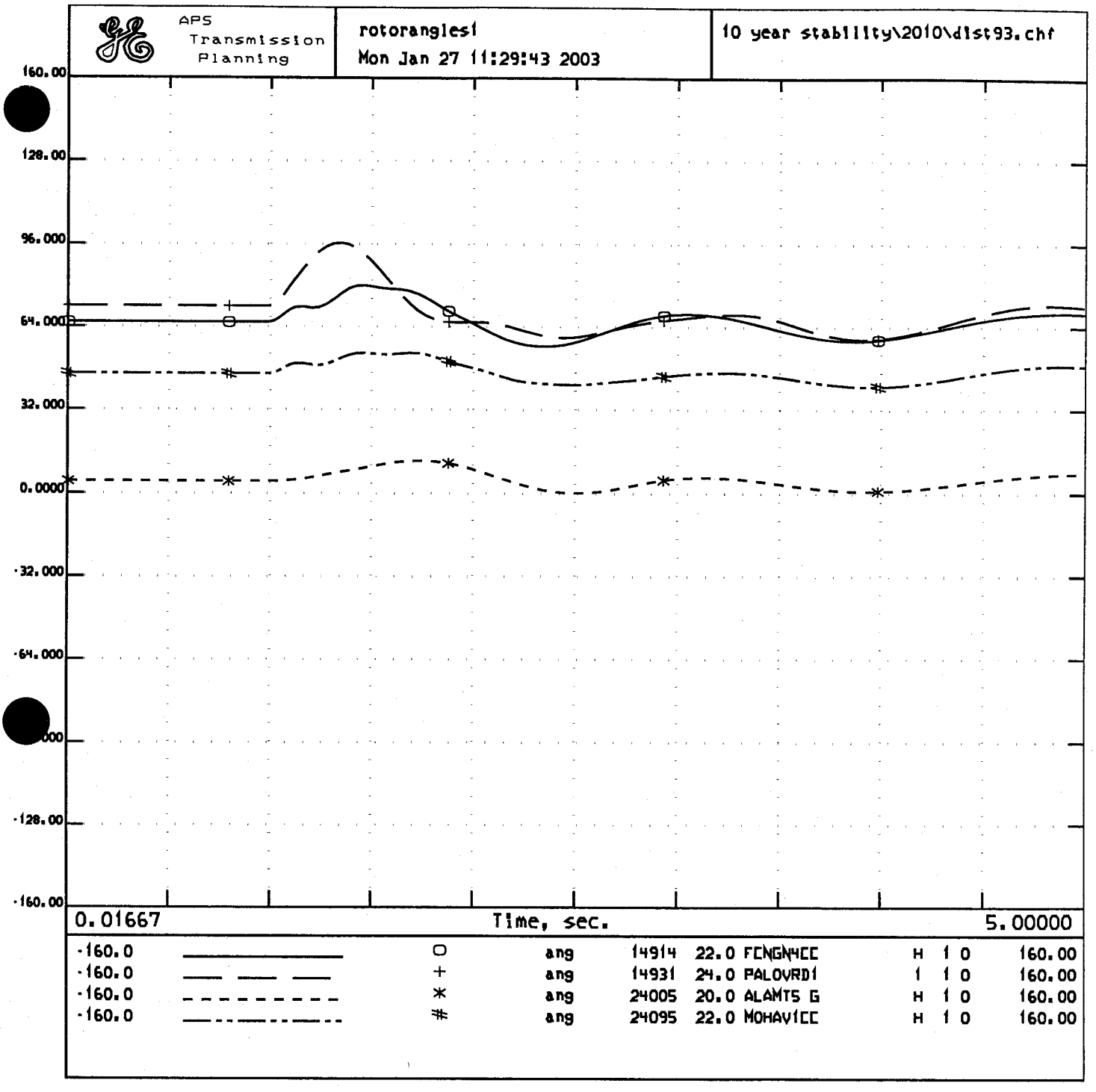

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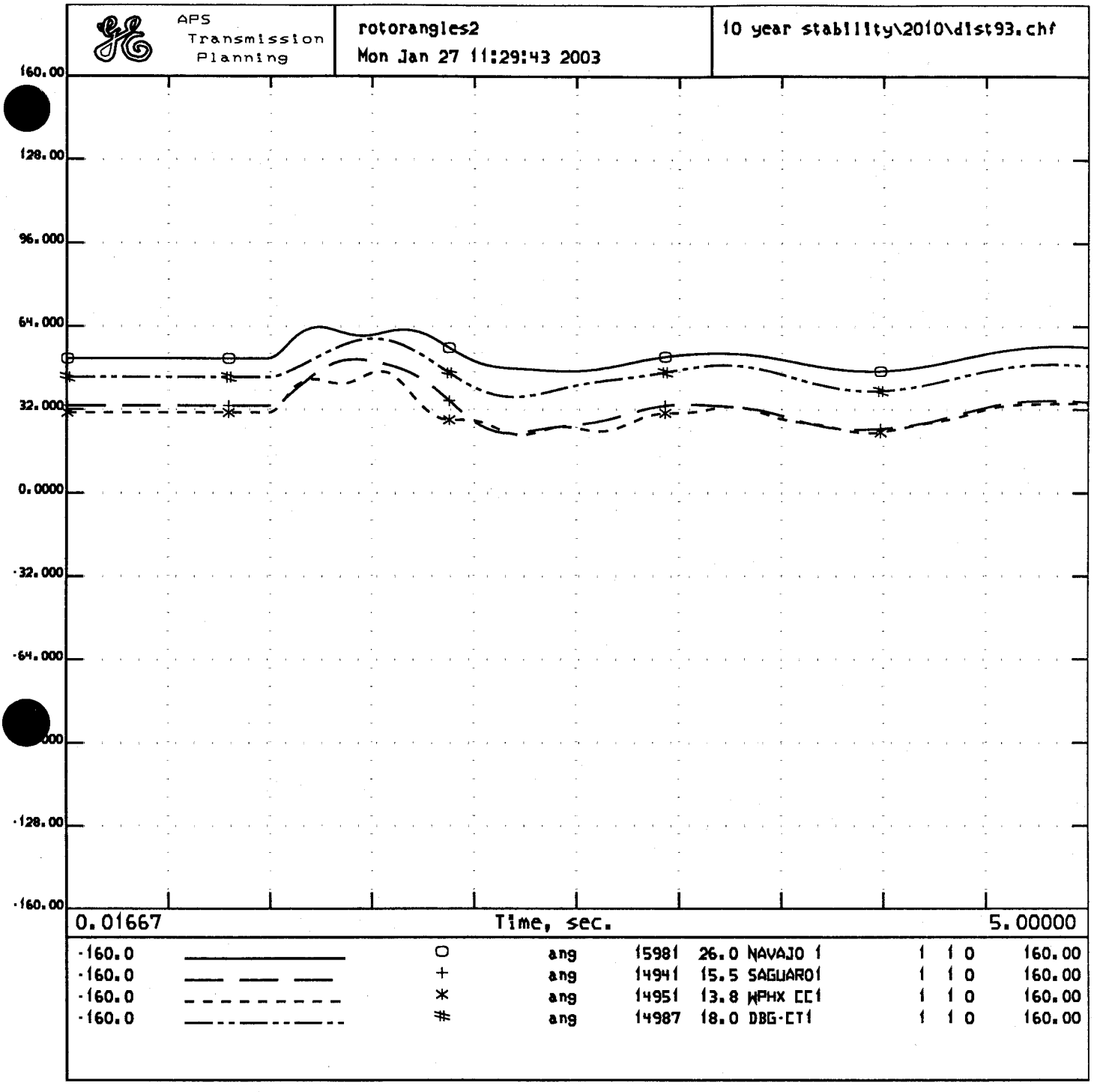

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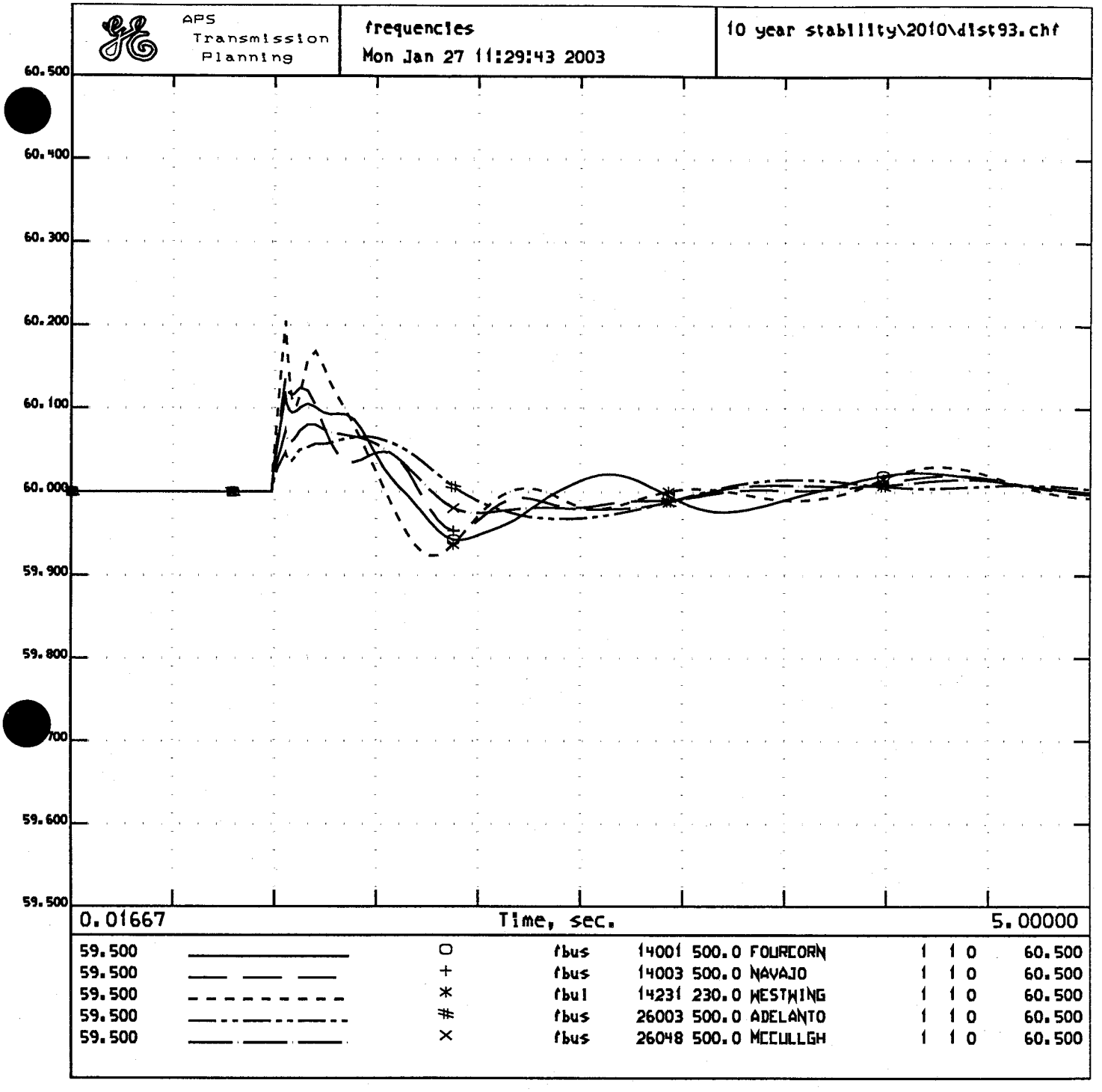

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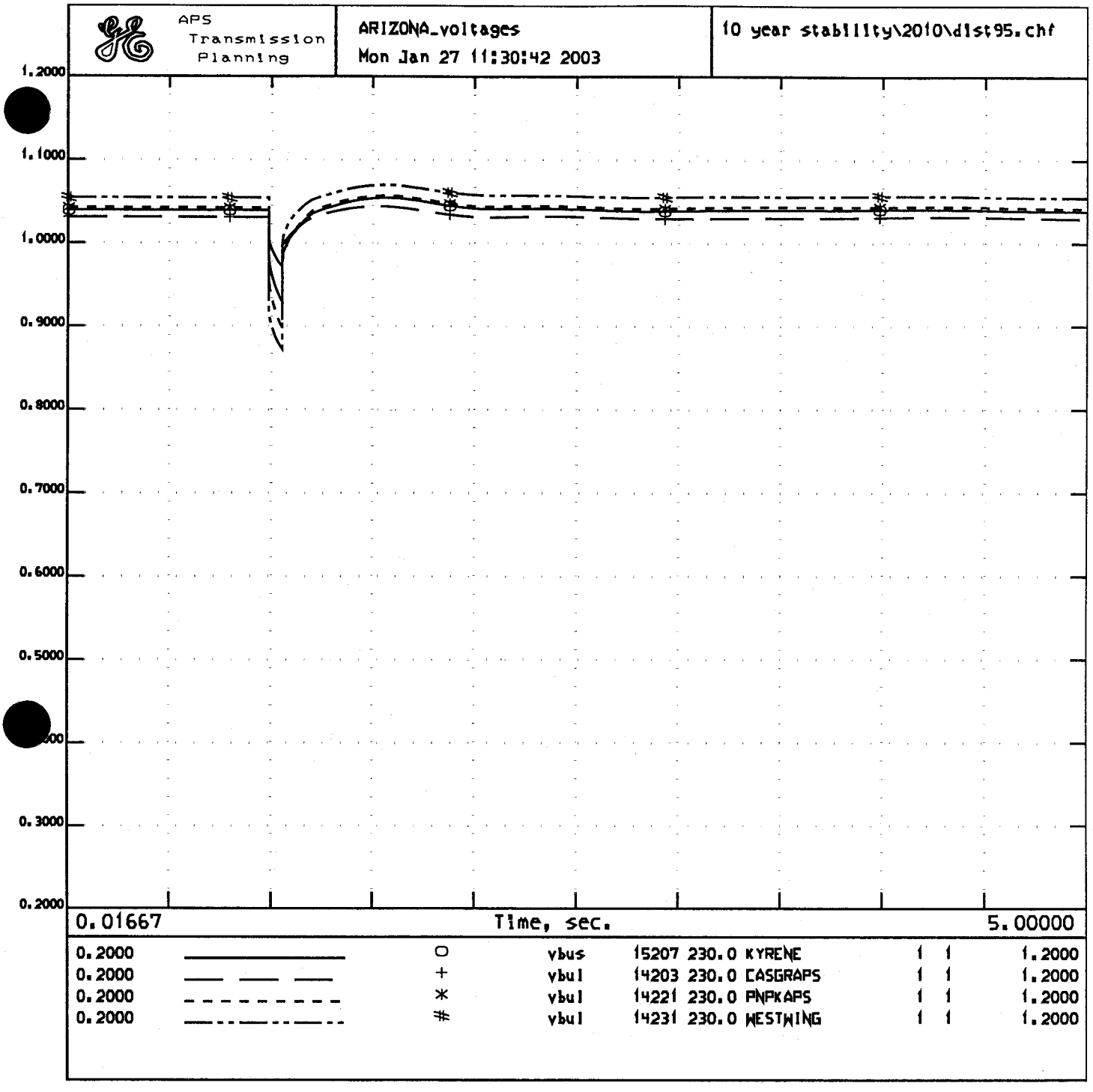

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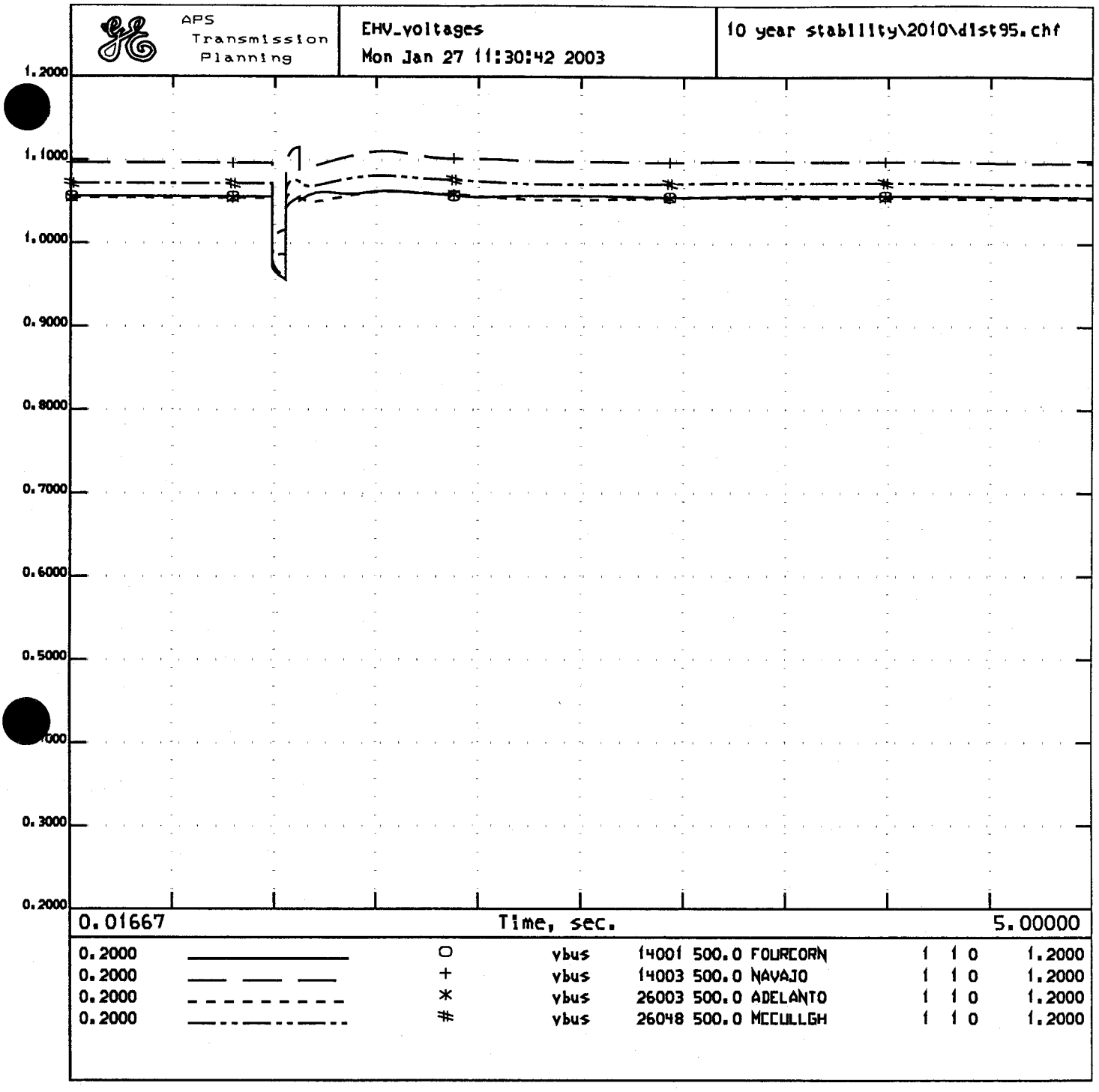

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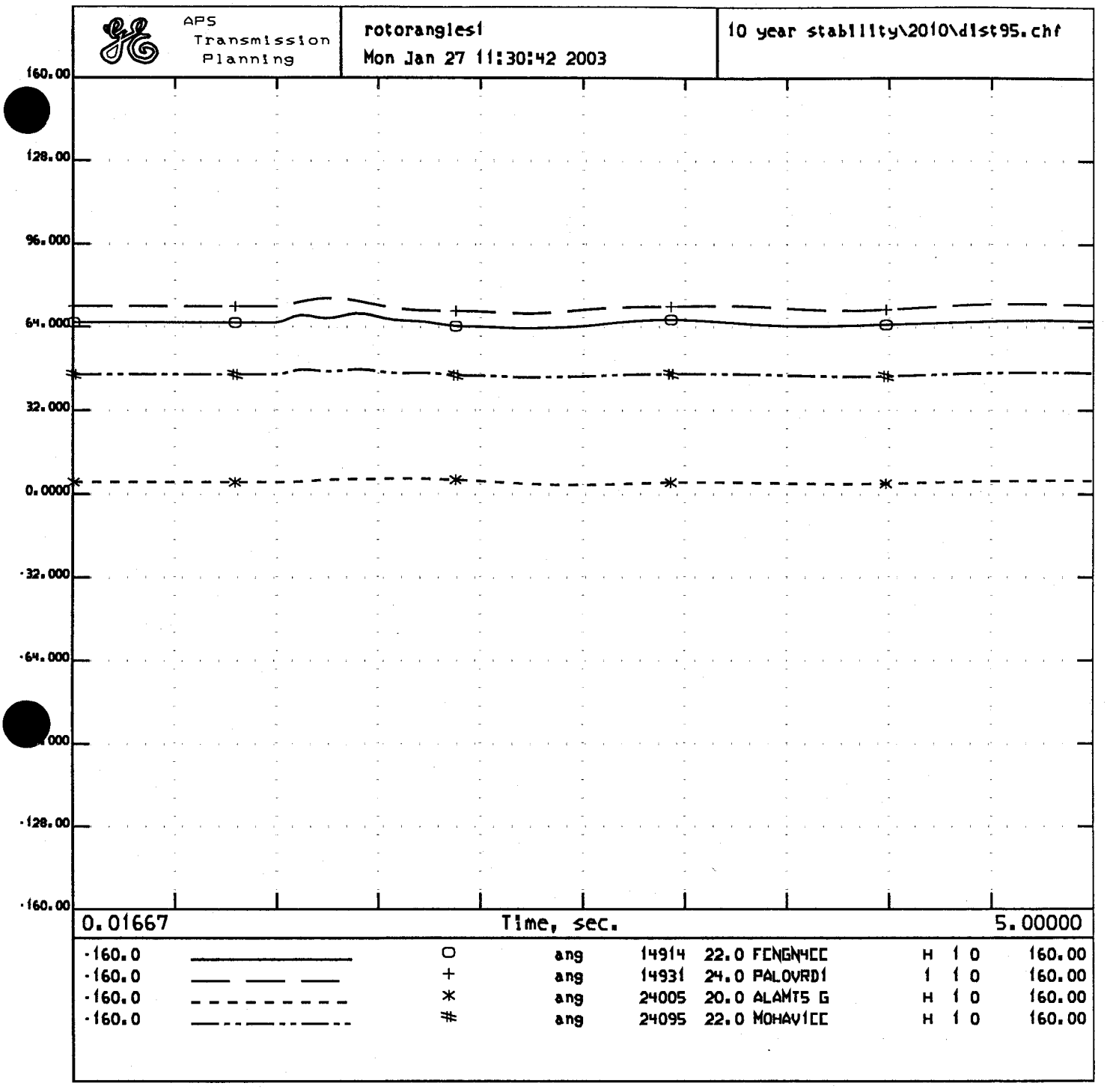

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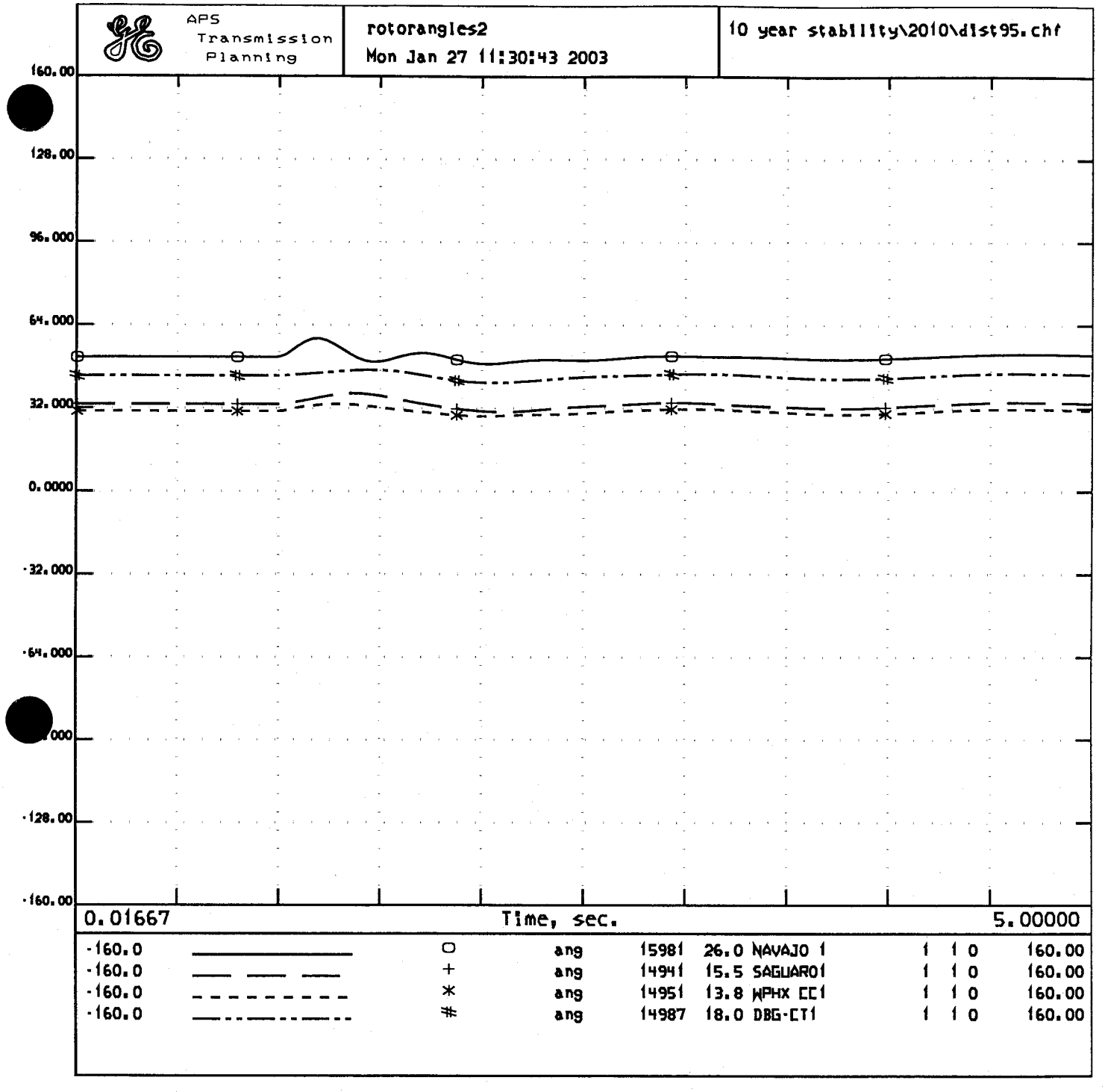

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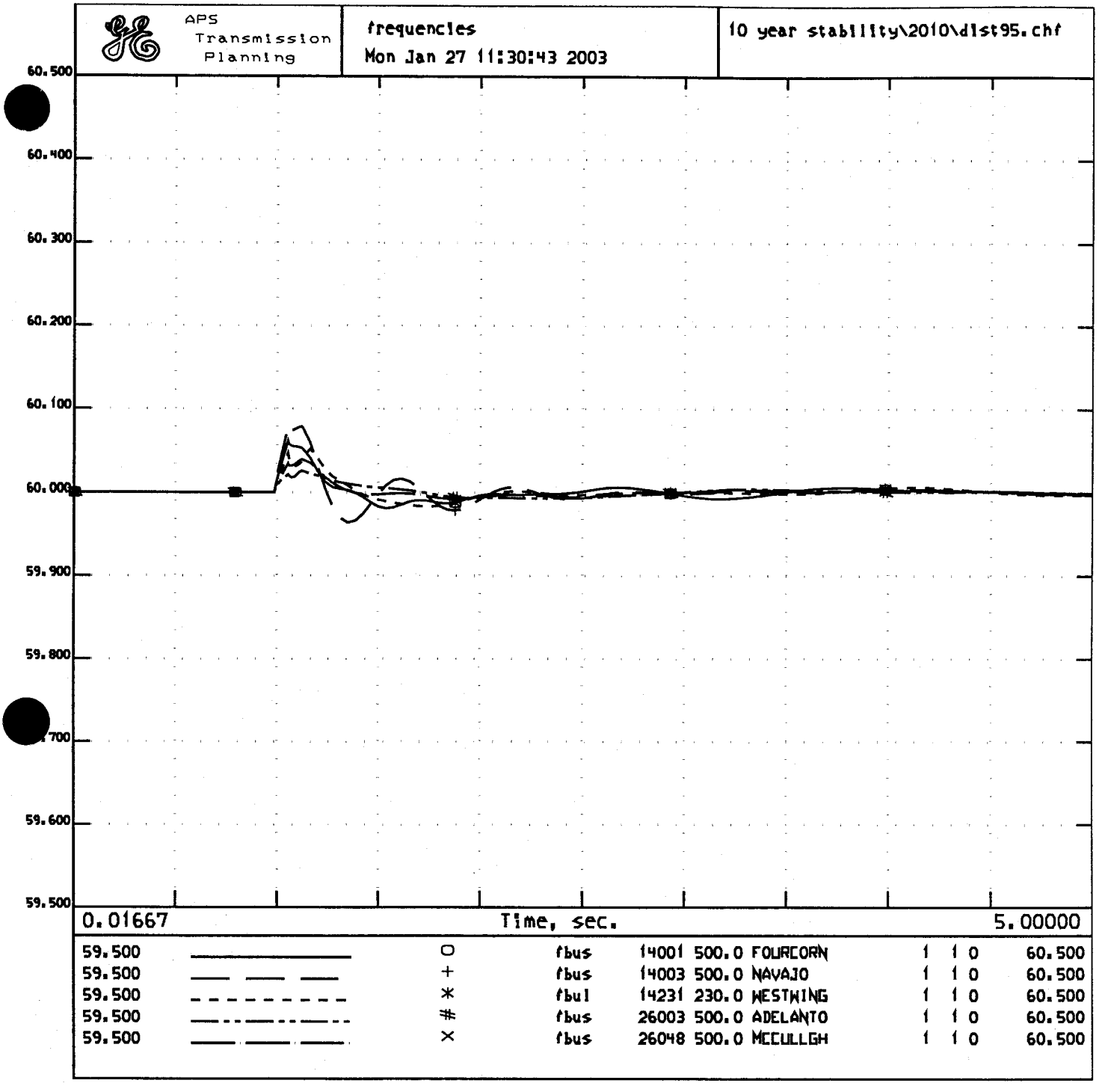

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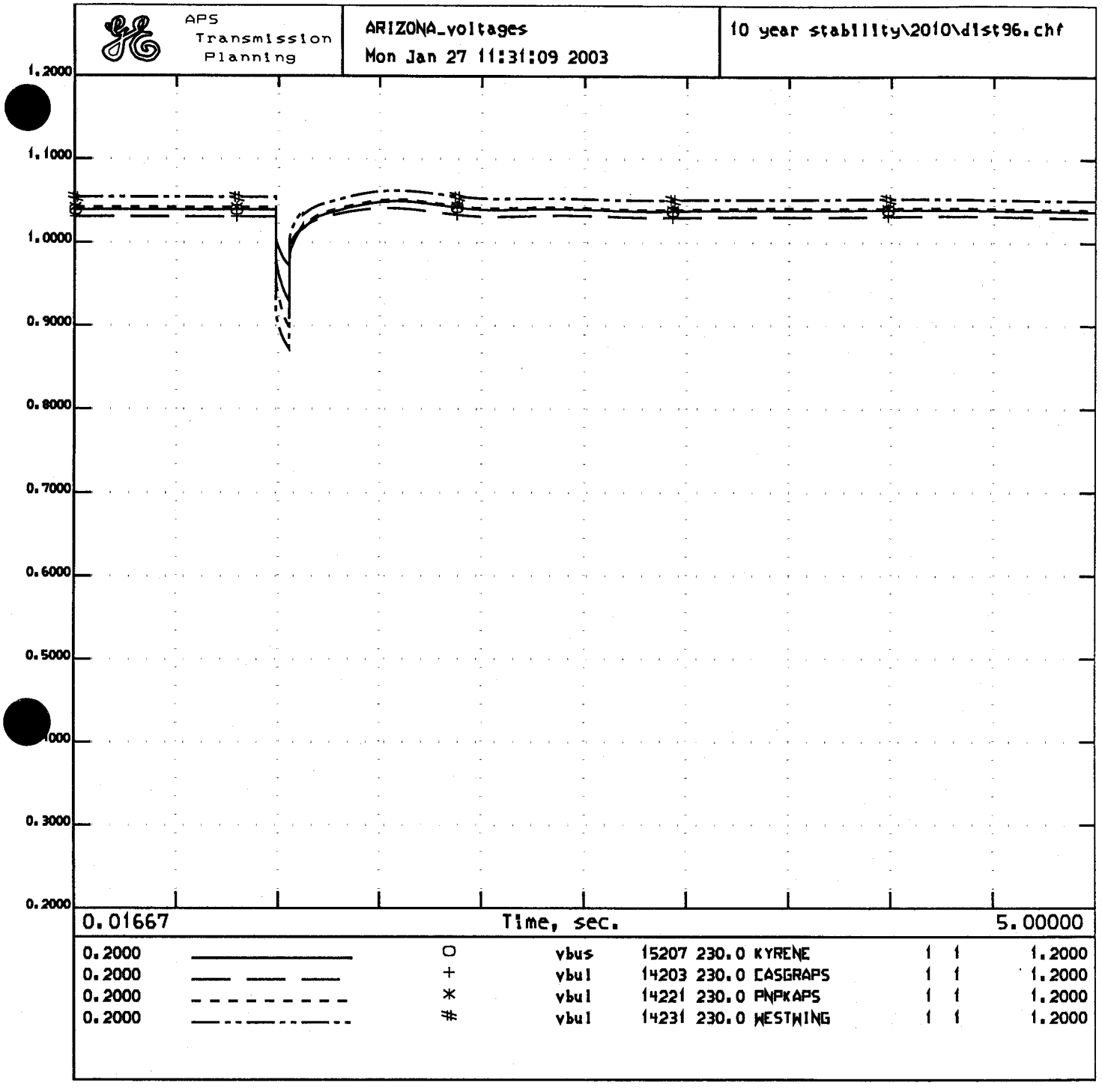

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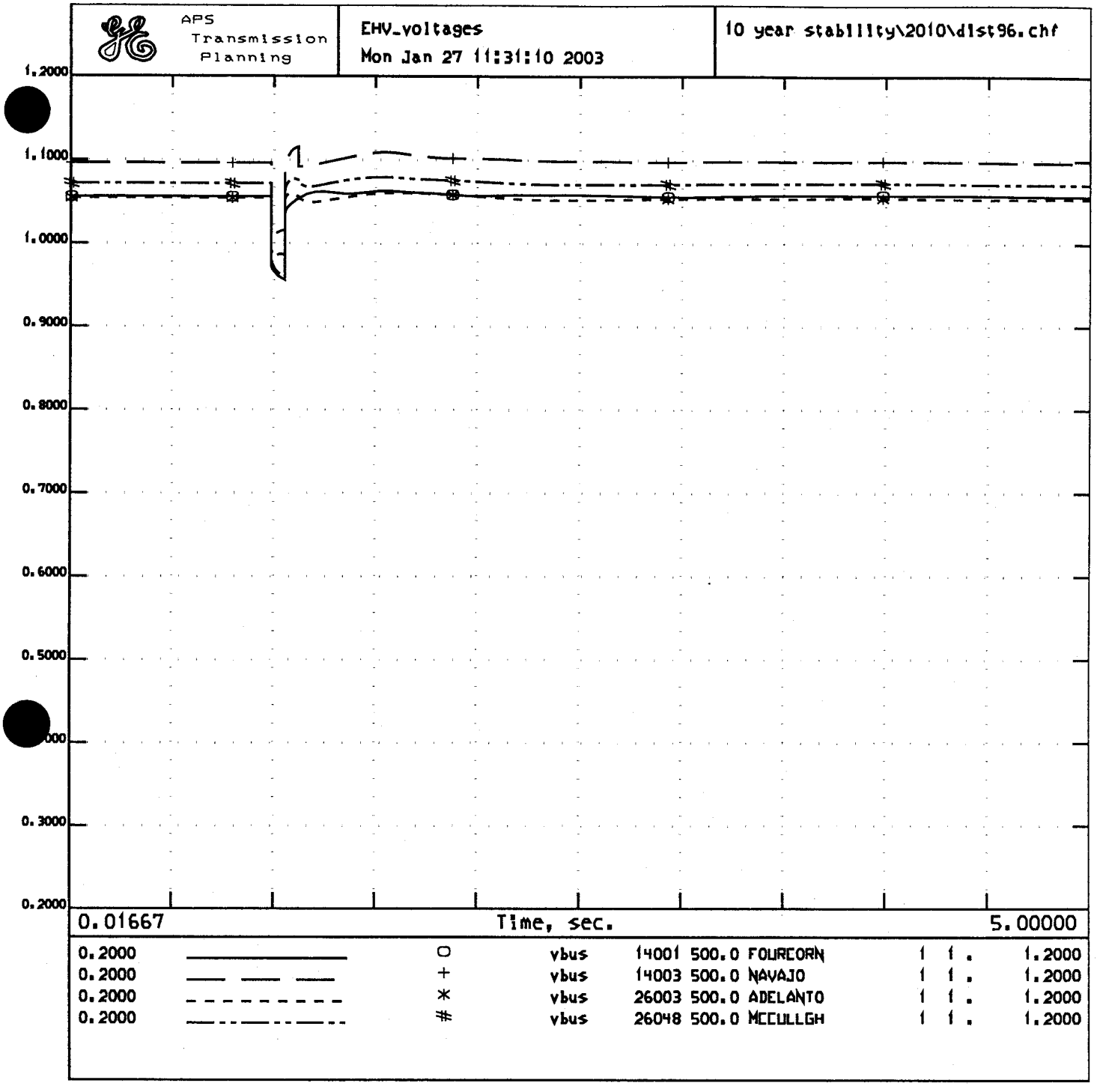

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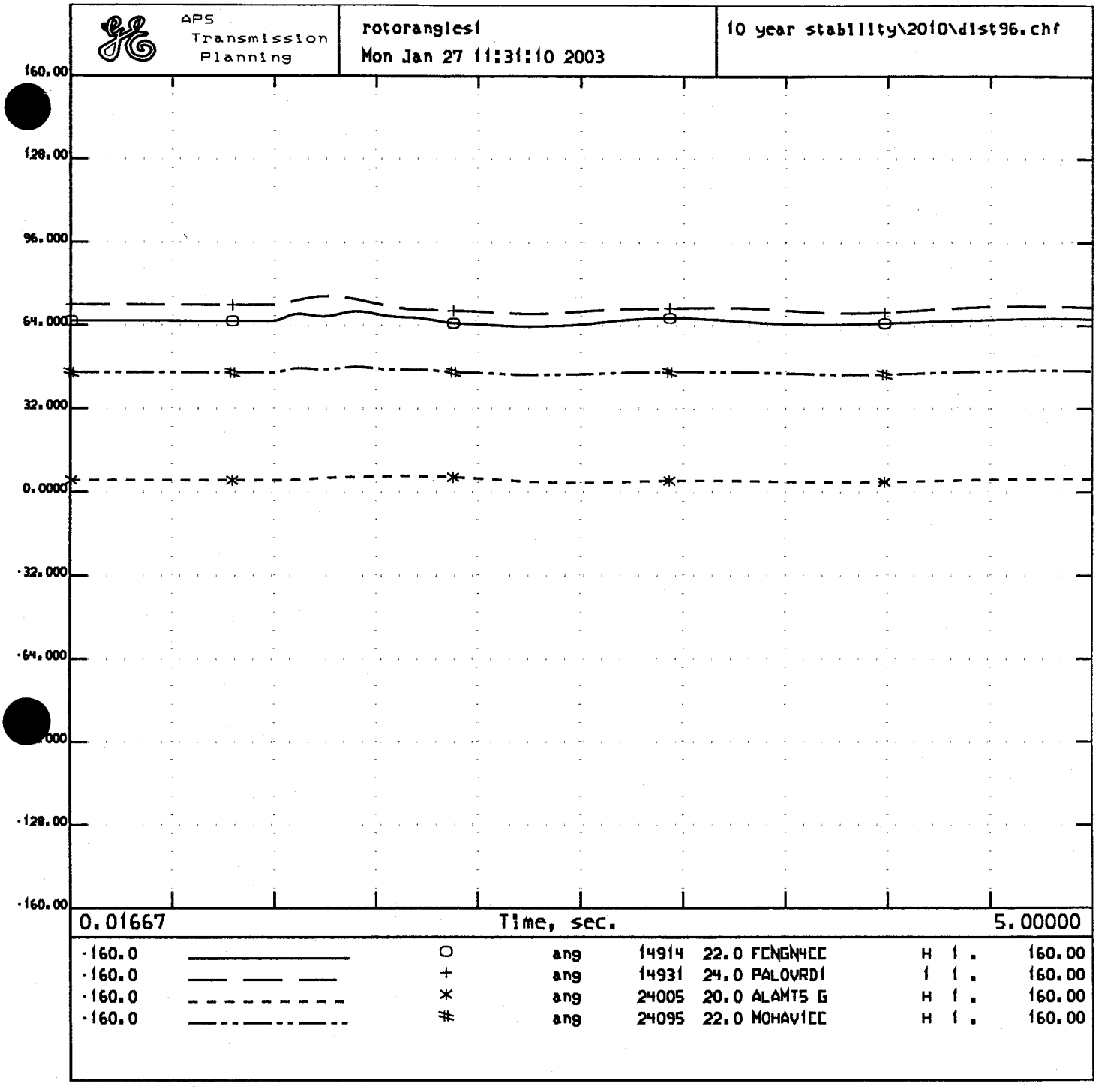

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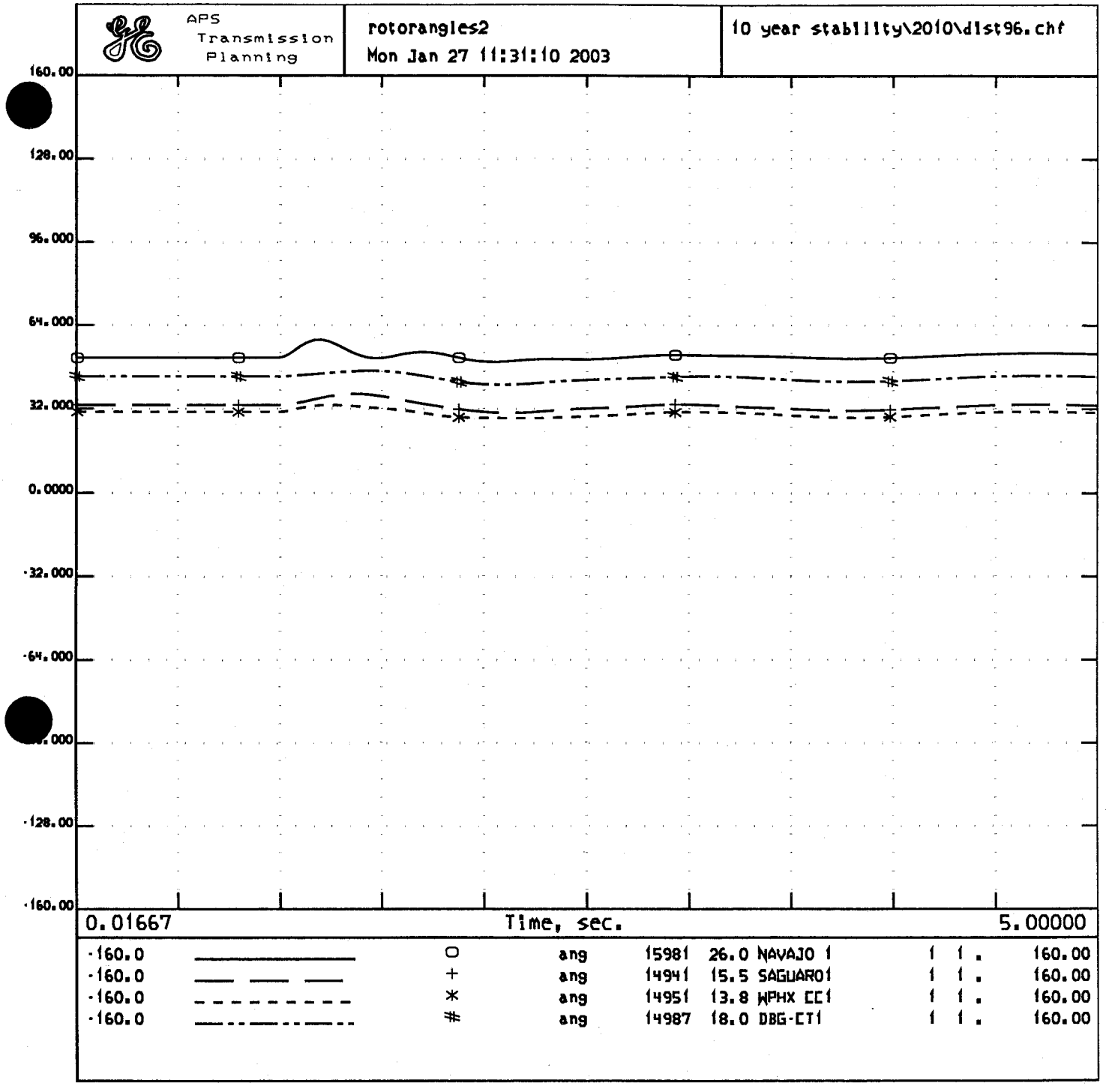

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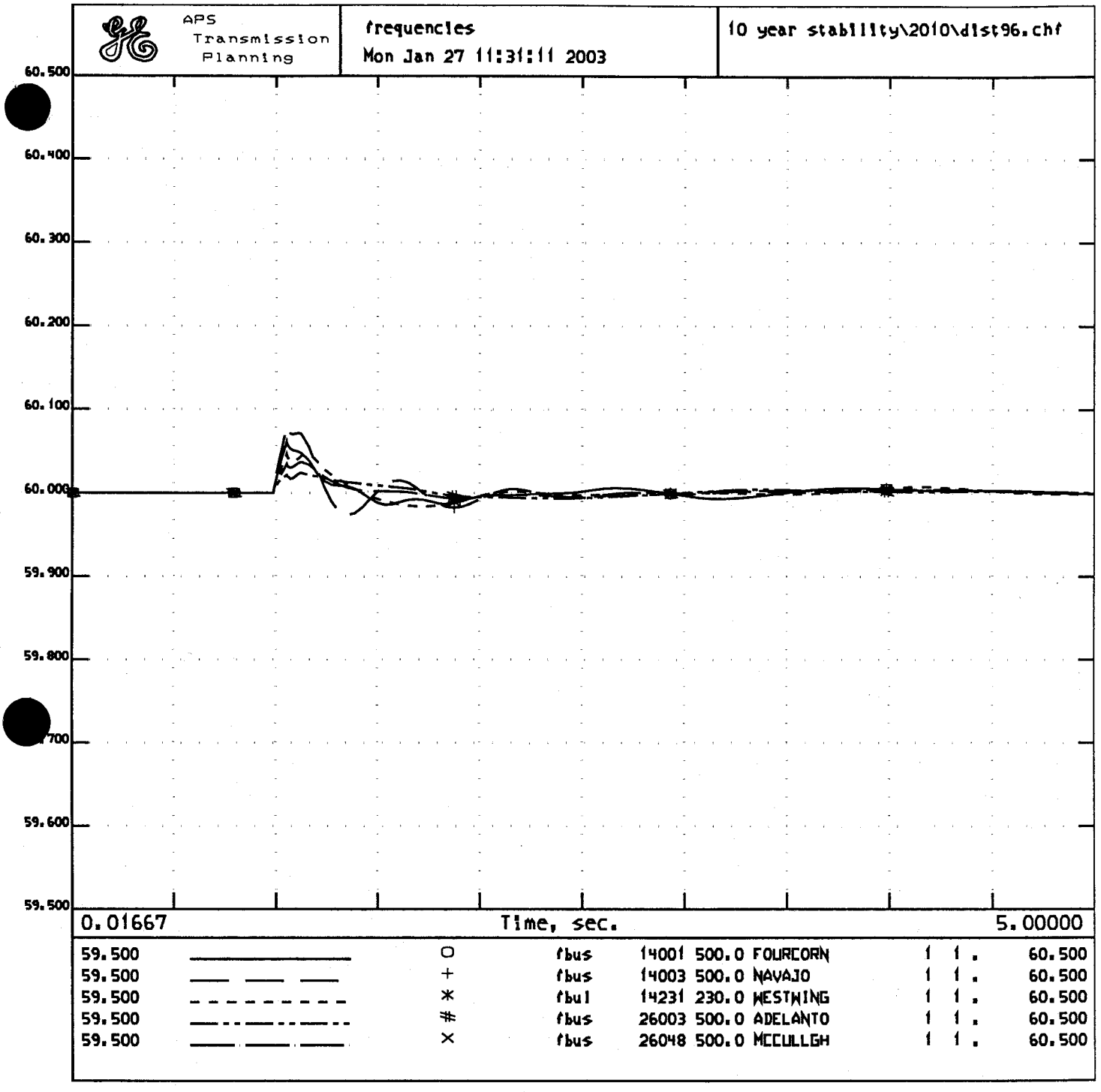

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