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| IN THE MATTER OF THE APPLICATION OF UNS GAS, INC. FOR ESTABLISHMENT OF JUST AND REASONABLE RATES AND CHARGES DESIGNED TO REALIZE A REASONABLE RATE OF RETURN ON THE FAIR VALUE OF THE PROPERTIES OF UNS GAS, INC. DEVOTED TO ITS OPERATIONS THROUGHOUT THE STATE OF ARIZONA. | **Docket No. G-04204A-06-0463** |
| | **Notice of Filing of Testimony of Marshall Magruder** |
| IN THE MATTER OF THE APPLICATION OF UNS GAS, INC. TO REVIEW AND REVISE ITS PURCHASED GAS ADJUSTOR. | **Docket No. G-04204A-06-0013** |
| IN THE MATTER OF THE INQUIRY INTO THE PRUDENCE OF THE GAS PROCUREMENT PRACTICES OF UNS GAS, INC. | **Docket No. G-04204A-05-0831** |

As directed in the Procedural Order of 8 September 2006, modified on 10 January 2007, the prefiled Testimony of Marshall Magruder is submitted to all Parties as of this date.

Respectfully submitted on this 7th day of February 2007 to all parties.

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ARIZONA CORP. COMM
400 W CONGRESS STE 218 TUCSON AZ 85701

MARSHALL MAGRUDER

By Marshall Magruder

Marshall Magruder

Arizona Corporation Commission
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**DIRECT**

**TESTIMONY**

**OF**

**MARSHALL MAGRUDER**

**FEBRUARY 7, 2007**

**In**

**ACC Docket No. G-04204A-06-0463**
**In the Matter of the Application of UNS Gas, Inc. for Establishment of Just and Reasonable Rates and Charges Designed to Realize a Reasonable Rate of Return on the Fair Value of the Properties of UNS Gas, Inc. devoted to its Operations Throughout the State of Arizona,**

**and**

**ACC Docket No. G-04204A-06-0013**
**In the Matter of the Application of UNS Gas, Inc. to Review and Revise its Purchased Gas Adjustor**

**and**

**ACC Docket No. G-04204A-05-0831**
**In the Matter of the Inquiry into Prudence of the Gas Procurement Practices of UNS Gas, Inc.**

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# TESTIMONY OF MARSHALL MAGRUDER

## Part I – Background and Introduction

### 1.1 Introduction.

**Q. Please state your name, occupation and business address.**

A. My name is Peyton Marshall Magruder, Jr. I am a customer of UNS Gas and UNS Electricity, two energy public service companies that serve Santa Cruz County. I was Vice Chairman of the Santa Cruz County/City of Nogales Energy Commission, and have been active in various community projects including the Tubac Community Center Foundation and the AARP tax aide program.

I have several jobs including Senior Scientist and Information Systems Architect for Integrated Systems Improvement Services (ISIS), Inc. in Sierra Vista, Arizona, working with information warfare, systems architectures, electronic and communications intelligence systems test plans, information assurance, cryptologic systems management, and information technology services. I am Systems Engineer and Training Systems consultant for Imagine CBT, Inc., at Raytheon Naval and Maritime Systems in San Diego doing systems engineering work with US and Royal Navy aircraft carriers and amphibious warfare ship's command, control, communications, computers, intelligence, surveillance and reconnaissance systems, and training systems. January through April, I also work as Tax Advisor Level 3 for H&R Block, Inc, in Tucson, Arizona. I retired from Raytheon/Hughes Aircraft Company as a Senior Systems Engineer after nearly 18 years and as an Officer in the US Navy for 25 years. Please see Exhibit A for additional work experience.

As an instructor in the University of Phoenix MBA programs, I taught courses on "Operations Management for Total Quality" and "Managing R&D and Innovation Processes" in the Nogales, Arizona, where all the students were from Mexico, and in Tucson, Arizona. I am preparing a course on the DOD architecture framework systems engineering process. In addition, I am the Vice President of the Martin B-26 Marauder Historical Society and served as Fund Raising Chairman for an ongoing five-million dollar "Lasting Legacy" fund drive to endow the MHS International Archives and the restoration of a B-26 Marauder aircraft at the Pima Air and Space Museum/Arizona Aerospace Foundation, Tucson.

My business address is PO Box 1267, Tubac, Arizona, 85646-1267.

**Q. Have you previously testified before this Commission?**

A. Yes, in appearances at ACC Open and Special Meetings and as a party in the following ACC Dockets:

a. Arizona Power Plant and Transmission Line Siting Case No. 111[1] (TEP's CEC Application);

b. Docket No. E-01032C-00-0951[2], the Citizens Purchase Power and Fuel Adjustment Clause (PPFAC) hearings;

c. Docket Nos. E-1033A/E-01032C/G-01032C-02-0914[3], the UniSource-Citizens Acquisition hearings;

d. Docket No. E-04230-03-0933[4], the UniSource-Sahuaro Acquisition hearings.

e. Reopened and ongoing Docket No. E-01032A-99-0401, the Santa Cruz County service quality, analysis of transmission and proposed Plan of Action case, and

f. Reopened Arizona Power Plant and Transmission Line Siting Case No. 111,[5] and which may reconvene depending upon the resolution of the E-01032A-99-0401 Docket.[6]

The testimonies presented with these filings are totally mine and are not for another.

**Q. What is your educational background?**

A. My latest degree is a Master of Science in System Management (MSSM) with majors in human factors and R&D from the University of Southern California with 'A's' in all courses. I

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[1] This case was before the Arizona Power Plant and Transmission Line Siting Committee, Case No. 111, and ACC Docket Nos. L-00000C-01-0111 and L-00000F-01-0111 was for "the matter of the joint Application of Tucson Electric Power Company and Citizens Communications Company, or their Assignee(s) for a Certificate of Environmental Compatibility for a proposed 345 kV transmission line ystem from Tucson Electric Power Company's existing South 345 kV Substation in ...Sahuarita, Arizona, to the proposed Gateway 345/115 kV Substation in ... Nogales Arizona, with a 115 kV interconnection to the Citizens Communications Company's 115 kV Valencia Substation in Nogales, Arizona, with a 345 kV transmission line from the proposed Gateway Substation to the International Border ...," submitted on 1 March 2001." This case resulted in ACC Decision No. 64356. I was an Intervenor and Party. Siting Case No. 111 has been reopened including ACC Decision No. 82011 that previously closed ACC Docket No. E-01032A-99-0401.

[2] This case was before the ACC "in the matter of the Application of the Arizona Electric Division of Citizens Communications Company to change the current purchase power and fuel adjustment clause rate, to establish a new purchase power and fuel adjustment clause bank, and to request approval of guidelines for the recovery and cost Incurred in connection with energy risk management initiatives," on 28 September 2000.This was reflected in ACC Decision No. 66028 of 18 December 2002. I was an Intervenor and Party.

[3] This case was before the ACC "in the matter of the joint Application of Citizens Communications Company and UniSource Energy Corporation for the approval of the sale of certain electric utility and gas utility Certificates of Convenience and Necessity from Citizens Communications Company to UniSource Energy Corporation the approval of the financing for the transactions and other related matters." This case was combined with the Citizens PPFAC Case in ACC Decision No. 66028 filed on 18 December 2002. I was an Intervenor and Party.

[4] This case was before the ACC "in the matter of the reorganization of the UniSource Energy Corporation." I was an Intervenor and Party.

[5] This re-opened case is before the ACC. I am an Intervenor and Party in the reopened case.

[6] This re-opened case is before the ACC. I am an Intervenor and Party in the reopened case.

also hold an MS degree from the Naval Postgraduate School, in Physical Oceanography for the study of the physics of the ocean with several electrical engineering courses involving underwater acoustics. In addition, I took advanced graduate-level EE courses at the University of Rhode Island involving acoustic array design, and electronic beam forming and steering. A Bachelor of Science Degree and Commission in the United States Navy was awarded by the United States Naval Academy with extra courses in Operations Research/Analysis and the History of Russian Naval Tactics. I am a long-time member of the American Society of Naval Engineers, the premier naval shipbuilding organization. I am a life member of the Naval Academy Alumni Association, the United States Naval Institute, the Navy League, and the Naval Surface Warfare Association and a member of the Armed Forces Communications-Electronics Association and the Naval Submarine League.

See Exhibit A for further details.

**Q. Could you explain what you do as a Systems Engineer?**

A. A Systems Engineer coordinates, plans, schedules, integrates and manages engineers of various other disciplines. The Systems Engineer is the technical lead or director for projects. The Systems Engineer determines the customer's need and analyzes the requirements, leads and/or writes the system and subsystem technical specifications, prepares and makes trade-off technical and economic (best and cost of ownership values) decisions, manages the entire system development process and leads system and subsystem tests to ensure the system accomplishes the customer's requirements and satisfies the need and requirements within budget and schedule. The integration and synthesis of this discipline use inputs from mechanical, electrical, civil, safety, life-cycle, and human factors engineers; integrated logistics, financial, maintenance, structural, and reliability data, operator and maintenance training development, aerospace, acoustic, computer systems, software, hardware, production, test and test equipment engineers and other specialist disciplines.

As the Systems Engineer for dozens of different and diverse projects summarized in Exhibit A, the Santa Cruz service area gas system is a simple, straightforward system for me to review.

**Q. How long have you been interested in the matter in this hearing?**

A. In the late summer of 2006, when reading the mail insert with my UNS Gas bill, I learned that a new UNS Gas rate case had been filed. The extraordinary increase in the proposed residential Service Charge from $60 in 2003 to $204 per year seemed unjustifiable, as there have been almost no significant projects in this county during the time span covered. This 340% rate increase turns out to be over 100% per year. Many natural gas ratepayers in

Santa Cruz County are struggling to pay today's gas bills. Most customers are not aware of the proposed increase because few customers read bill inserts. After reviewing the on-line filing, additional areas of concern were included in my Motion to Intervene.

My subsequent, more detailed review seems to indicate that a realistic rate case has not been presented the Commission. The UNS Gas Application has significant flaws in its structure and these will confuse anyone's understanding of what is needed.

Since then, I have been actively interested in this matter.

## Part II – Purpose of this Testimony

**Q. What is the purpose of your testimony in this proceeding?**

A. The purpose of this testimony is to present the significant concerns with respect to the following areas:

1. The Proposed Significant Service Charge (Part III),
2. Restructured cost including product cost within the Service Charge (Part IV), and
3. Additional transition capital and personnel costs from Citizens to UNS Gas (Part V).

This testimony contains conclusions and recommendations for consideration by the Administrative Law Judge and the Commission.

**Q. What is the basis of the recommendations in your testimony?**

A. An analysis of the Application shows significant and potential structural rate design flaws resulting in a proposed new rate design that is both unfair and discriminatory to some customer classes in Santa Cruz County.

## Part III – The Proposed Significant Service Charge Increase

**Q. Why are you concerned with the proposed increase in Service Charge?**

A. First, the Service Charge (or Cost of Service) is one of the three major components of a utility bill. The Cost of the Product, in this case, natural gas, is the second component; taxes and miscellaneous regulatory fees are the third. In general, public service companies receive their revenue from the Service Charge. The product costs are in the second part, a "pass through" to the customers in the distribution utility. UNS is a distribution utility, and its revenue for capital and cost of business expenses is separate from the cost of gas delivered to customers. For decades this separation has been observed and is well understood by those who can read and understand their utility bills. Many customers do not understand this process. Mixing these two components will not be beneficial as discussed in Part IV below.

Service Charges for residential customers since 2003 are shown in Table III-1 below:

***Table III-1 Service Charge History and Proposed New Service Charge***

| Dates | Monthly Service Charge | Annual | Company |
|---|---|---|---|
| Prior to August 2003 | $ 5.00 | **$ 60.00** | Citizens |
| August 2003 – ~July 2007 | $ 7.00 | **$ 84.00** | UNS Gas |
| After July 2007<br>(if approved in this case) | December – March $ 9.00<br>April – November $22.00 | **$ 204.00** | UNS Gas |

The August, 2003 Service Charge was increased by 40% when the company transitioned from Citizens to UNS Gas. At that time there was also a 22% rate increase for cost of natural gas to cover the cost of raising natural gas prices. The **proposed 340% Service Charge increase** over the 3 to 4 years under UNS Gas ownership is not justified or explainable to ANY ratepayer. There has not been that amount of significant capital improvements. In Pignatelli Testimony, he states "we project that the number of UNS Gas customers will increase as much as 5-10% annually." [*Pignatelli Testimony*, 1 at 26] At best, capital costs in a Service Charge based on this kind of growth and increased productivity generally should be less than 30%. Since inflation has been less than 5% each year, when combined to determine Service Cost, using the existing rate structure process (see Part IV), there is absolutely no justification for such a large increase. It also should be remembered that customers needing to be connected for gas service pay for their service lines; therefore most of the capital costs for new service lines are not UNS Gas costs

**Q. Using the existing rate structure, what might be a reasonable Service Charge?**

A. The seasonal rate scheme, with higher Service Charges in the summer, only benefits selective rate payers, in particular those who have higher usage costs in the winter. Let us look at the benefits and costs of such a scheme as shown in Table III-2 below:

***Table III-2, Based on Season, the Full and Summer/Winter Residential Impacts of the Seasonal Service Charge Rate Changes.***

| Resident \ Season | Winter | Spring/Fall | Summer |
|---|---|---|---|
| Full year | Lower Monthly rate to reduce winter bill | Rate adjusted to lower winter bill | Higher Monthly rate reduce winter bill |
| Summer only | Higher Monthly rate without gas consumed | Rate adjusted without consumption | Higher Monthly rate when gas is consumed |
| Winter only | Lower Monthly rate to reduce winter bill | Rate adjusted without consumption | Lower Monthly rate without consumed |

In Table III-2 we see that some will have higher rates without consumption, some lower rates without consumption, some have adjusting rates without consumption and further changes. This would not reasonable for the winter-only and summer-only residents, a high percentage of the UNS Gas service customers in Santa Cruz County.

In Santa Cruz County, in some neighborhoods, nearly 50% of the residents are winter-only residents. Contrary to the Pignatelli Testimony, not all summer (or winter) homes are "luxury" [*Ib.,* 20 at 26]. Winter only residents, with higher/lower Service Charge in Table III-, are not considered at all.

The factors mentioned in Part IX of the Pignatelli Testimony are extremely detrimental to residents in warmer parts of the UNS Gas service area, in particular Santa Cruz County, which is warmer due to its geographic location. Cost of utilities is an important factor for potential new customers, those considering moving in the area. By deliberately designing a rate structure that goes against the climate reality of southern Arizona is contrary to fair and just treatment of consumers. Suppose I want to live in Snowflake. It is obvious utility bills will be higher there due to its geographic location when compared to Santa Cruz County. Proposing a rate structure to penalize such logic should not even be considered. The higher-use customers are not being used "to subsidize the true cost of serving lower-usage customers." [*Ib.,* 20 at 21] The "higher-use" customers should know they live in colder areas. It was their decision to live there and it should not be paid for by those in warmer parts of our state.

Mr. Pignatelli testified, that "higher than expected usage can increase margin revenues beyond anticipated levels, while lower usage can result in an under-recovery of the utility's costs." [*Ib.* 20 at 5] It is not the Commission's responsibility to manage risk for seasonal variations. Weather temperature risk factors are foreseen, expected, and predicable; good management always takes all factors into account when making decisions. Any rate structure, based on passing the responsibility of risk management of seasonal variations to the Commission should not be considered. In other hearings, I have asked his employees if there were a meteorologist on staff at UniSource. The response has been that there is not been one, but that staff did check the Internet for weather information. Without such expertise used daily for risk management decisions, this corporation will continue to be ill-informed about the operational environment in both short- and long-term planning and decision making.

Also, UNS Gas is proposing that the Commission "approve" UNS Gas' Price Stabilization Policy. This is an internal policy, under internal control. It could be modified at any time by the company; no assurance that this will not be the case is given. Exhibit DGH-1 is for 2006 thus is already outdated by a newer 2007 version. Their Application needs updating. The mandatory compliance verb "shall" is used once in the entire document. Exhibit DGH-1 is vague, for example, in paragraph 2.1 on page 3, this pricing strategy is "used by UNS to stabilize gas prices." Does this imply that UNS Gas purchases natural gas

for UniSource Energy (UNS) including Tucson Electric and Power Company (TEP) and UNS Electricity or just for UNS Gas? This could be more significant. Without mandatory provisions, an internal practice such as this is unsatisfactory and definitely should not replace the detailed audits accomplished by ACC Staff and RUCO in all rate proceedings. In fact, suggesting that this weak document replace the prudency audit has no merit. If the Commission allows this document to replace their reviews, liability for any poor decisions or losses based on this practice could cause significant liabilities to the Commission instead of shareholders. Shareholders are the ones who should absorb losses.

Most of the testimony presented in this Application is from TEP personnel, perhaps on some kind of "loan" to a separate, independent public service company, regulated by the Commission. Without very close accounting, such as strict time card practices, separation of which UNS subsidiary "pays" for services from another is challenging at the least. In my decades of Department of Defense contracting work, this issue is always at the forefront of management to manage and control. This concern is also discussed in Part IV below.

**Part IV – Restructured Cost Structure including Product Cost in the Service Charge**

**Q. What are your concerns about the proposed Rate Structure?**

A. The proposed rate structure combines both natural gas transmission and distribution cost and the cost of service. The mixing of product and cost of service costs is contrary to prior business practices in this industry but more significant is the loss of traceability to product cost and to service cost, a key element of this rate case If traceability is lost or muddled, future rate cases will not be able to track costs to either rates or expenses of this regulated public service company.

For a practicable example, I can see from my window the El Paso Natural Gas (EPNG) line easement and the interconnecting substation to the local UNS Gas main and service lines for my home. EPNG is paid by UNS Gas to supply natural gas to the substation for local distribution. When natural gas is consumed it is reasonable to pay EPNG transmission and distribution charges for the volume of natural gas delivered to my home. Conversely, it is not reasonable, fair or just to charge for transporting gas via EPNG's line when I use no natural gas. It is false charging to require one to pay EPNG transportation and distribution volumetric charges when a customer does not use any natural gas. The combining of any transportation (or volumetric charges) that are not absolutely fixed UNS Gas infrastructure expenses in the "fixed" part of the billing mixes and muddles the entire billing process which then will not be objective, auditable, or traceable.

Continuing in Part IX of the Pignatelli Testimony, these proposed policies confirm the above. See page 20 for non-explicit expressions such as "more closely", "very significantly", "typically", "most transmission and distribution costs", etc. Prudent cost of management and operations of its distribution and transmission system is a reimbursable fixed cost of service expense. The cost of transmission and distribution of natural gas is a volumetric expense and is related to product usage. Please maintain a clear, objective separation between service and product costs.

**Q. Using the extreme case, why should any customer pay for the actual transmission of natural gas, when they are not using any?**

A. The proposed rate structure charges customer for more than the value of the infrastructure required to deliver the product. This is unfair to the customer. The only benefit of such an approach would be to UNS. This approach would destroy any ability to protect future customer's rights in future rate cases.

Keeping Cost of Service independent of Cost of Product is a critical accounting and ratemaking concept being clearly violated by this proposal. One flaw in this conceptual approach is that without demand, there are minimal operational transmission and distribution costs, thus there is a relationship between volumetric demand and product cost.

Using the proposed mechanism, a Throughput Adjustment Mechanism (TAM), UNS Electric states that the TAM "will allow UNS Gas to implement the comprehensive energy conservation program proposed in this filing." This statement is without merit. Customers notice higher and lower bills and when too high, conservation is the easiest way to lower bills. Lowering the thermostat, full loads in gas clothes dryers, less hot water usage are all understood. UNS Gas can't expect customers to understand TAM or anything equivalent. They understand "cost of service" and "cost of natural gas" and the present billing makes that distinction; however the PGA and surcharges are not very clear. Mr. Voge's Testimony also failed to resolve these difficulties.

The existing residential bill has three volumetric charges, Distribution Margin, PGA Cost and PGA Surcharge.

The Distribution Margin should include the cost of transportation for the basic amount of natural gas and be based usage. Customers can understand this charge. Several data requests were submitted on this issue which maybe resolved in later filings.

The Adjustment charge, as requested in this application, will need to be redefined in order to account for price swings. No evidence presented shows how TAM reduces swings or the second adjustment, the PGA Surcharge.

The proposed "product cost" process is not satisfactory nor will it be understood by customers. Without customer understanding and support, there will be complaints.

**Part V – Additional Transition Capital and Personnel Cost from Citizens to UNS Gas ownership and continued operations (Third Issue)**

**Q. Why are you concerned about transition and personnel costs?**

A. There are two concerns. The first is the Pignatelli Testimony reference to the customer benefits due to the "negative acquisition premium" [*Ib.,* 16 at 20] needs to be watched closely as the ACC Staff and RUCO review the accounting details associated with this rate case to ensure these benefits are not lost.

The second "transition" concern is related to personnel costs and accounting. As pointed out above, most of the testimony provided in this case is from Tucson Electric and Power Company (TEP) employees, a separate public service utility company, regulated by the Commission. The TEP employees have worked for UNS Gas, another, separate, and independent public service utility, with its own and separate accounts. Tracking charges to UNS Gas from TEP to ensure that the correct labor and other associated charges are include for each of this two companies is a major challenge, made even complicated by the two holding companies, UNS Energy and UniSource Energy Services (UES) and the third public service company UNS Electricity, Inc. In my decades of DoD contractor experiences, where such costs are accurately accounted, management of this process is very challenging, strict, and requires continual monitoring of daily time cards (or equivalent), specific tasks being charged to the appropriate entity by personnel authorized to charge to that account, budget plans per task to prevent overruns, and sorting associated overhead, General and Administrative (G&A), and profits among different organizations.

Several open data requests have been submitted to help clarify this issue in future filings. If the personnel labor accounting practices are as weak at the Price Stabilization Policy, this issue requires further and detailed review by ACC Staff and RUCO. The wrong public service company could be charged or, worse yet, charges may be made to both, three or more organizations. Obviously ratepayers would be the ultimate losers.

## Part VI – Conclusions

**Q. Do you have any conclusions?**

A. Yes, but these initial conclusions might change as responses to data requests are received.

**Q. Have you come to any conclusions about the Increased Service Charge?**

A. 1. The proposed Service Charge increase is clearly too high.

2. The season choice should not be mandatory. Only an "annual" rate should be approved by the Commission with the Company authorized to charge higher "summer" or "winter" or "level" or "actual" monthly charges. The result is the same; let the customers chose how they prefer to pay the bill.

3. Mandated seasonal charges discriminate against a large number of customers in warmer areas to benefit others who choose to live where it is colder.

4. UNS Gas needs support from a qualified utility meteorologist or equivalent.

5. UNS Gas takes all risks due to hot and cold seasons, not the ratepayer.

6. The proposed internal "UNS Gas Price Stabilization Policy" is under total UNS Gas control; therefore, <u>any</u> Commission approval might incur inappropriate liability to the Commission. Further, significant clarification as to the applicability of this policy is missing.

7. Such a policy should not be substituted for any ACC and RUCO audits during rate cases.

8. Cross-charging internally within the various UniSource Energy (UNS) entities requires strict auditing to account for labor hours and other charged to other UNS entities,

**Q. What are your conclusions about the Restructured Cost Structure?**

A. 1. Mixing cost of service and product cost is contrary to best business practices, common sense and will make tracking costs too difficult.

2. The Applicant's proposed rate structure process is not clear, objective or traceable; there are many vague assumptions.

3. Transmission and distribution operational costs are dependent upon volumetric demand.

4. The conceptual process presented is without merit.

5. The proposed rate structure using Throughput Adjusted Mechanism (TAM) is not sound.

6. There is no relationship between TAM and conservation.

7. Distribution Margin needs to be reviewed to account for the operational costs that were proposed as part of Service Cost in the discussion of increased service charge.

8. The TAM does not dampen the swing of natural gas prices.

9. The proposed approach for product cost is unsatisfactory.

10. The use of TAM will make billing costs less comprehensible than the present process.

**Q. Do you have any conclusions about Transition and Personnel Cost?**

A. 1. The negative acquisition premium from the Citizens Acquisition case must remain intact to protect customer's benefits from that transaction.

2. Cross-charging labor and other costs must be continuously monitored to prevent abuse with severe penalties imposed to ensure compliance.

## Part VII – Recommendations

**Q. Do you have any recommendations?**

A. Yes. Based on the above initial conclusions, the following are recommended in an Amended Application:

1. Reduce the proposed Service Charge to the order of $100 per year or less.
2. Make the seasonal charge differential adjustment voluntary and not compulsory.
3. Remove all discrimination in rates between the Northern and Southern Counties.
4. Remove all seasonal risk from ratepayers.
5. Make major changes to the UNS Gas Price Stability Policy including adding an ACC reasonableness process review.
6. Eliminate any indication that the ACC will approve the UNS Gas Price Stability Policy.
7. Provide proof that "cross-" or "multiple-" labor charging does not exist at all UNS entities.
8. Eliminate any mixing of the cost of service and the cost of product and continue separation of service and product charges.
9. Delete the Throughput Adjusted Mechanism (TAM) concept.
10. Consider using Distribution Margin to include specific, measurable, and defined fixed costs that are NOT related to the volume of natural gas.
11. Revise the PGA and Surcharge eliminating TAM.

In addition, the ACC and RUCO should monitor the negative acquisition premium to ensure the same benefits remain in force when UNS Gas was established, continue the prudency review process, ensure seasonal variation risks are company and not ratepayer risks, and retain separation of cost of service and product cost in the resultant rate structure.

## Part VIII – Summary

**Q. Would you please summarize your testimony?**

A. The recommendations in Part VII show there are major changes required by the Applicant. Without these changes, unfair and unreasonable rates will result for customers. The deliberate discrimination against the warmer, e.g., Santa Cruz, counties is an inappropriate way to lower rates in colder areas. The mixing of cost of service with product costs will make correct accounting impossible. Risks are borne by the company and not the ratepayers. These and other substantive changes are needed and to be expected in updates to this flawed Application.

This application is so confusing that there must be other significant flaws not discussed that require correction as soon as possible.

Unanswered data requests might change this Testimony.

**Q. Does this conclude your direct testimony?**

A. Yes.

Exhibit A

## Resume of Marshall Magruder

### Education

MS in Systems Management, University of Southern California, Los Angles, California (1981)
MS in Physical Oceanography, Naval Postgraduate School, Monterey, California (1970)
BS, US Naval Academy, Annapolis, Maryland (1962)

### Experience

Over 25 years as Senior Systems Engineer with and an associated contractor, consultant to Raytheon-Hughes in systems engineering, training and naval systems, simulation and modeling in C4I; with over 20 years of service with the US Navy, a total over 40 years experience in this field

- **Large-system development** at all levels
  **From** pursuit, analysis, winning strategy, Request for Proposal evaluation, proposal management, system requirements analysis, architectures, specifications, design synthesis, trade-off studies, requirements allocation tracking,
  **To** system, level test planning, deployment, implementation, through sign-off, and
  **For** technical systems of all complexities.

- **Developed** Antisubmarine Warfare (ASW), Electronic Warfare (EW), Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) operational concepts, procedures, and tactical employment.

- **Used, operated, and planned** Navy, Army, Air Force, Coast Guard, Joint systems, world-wide.

- **Coordinated multi-platform employment** from sensor to unit to Battle Force to Theater levels.

- **Qualified systems engineer/manager** for trainers, artillery, Command and Control (C2), countermeasures, for any platform.

- **Specialties:** environmental analysis, documentation, sensor/weapon predictions, C4ISR, Electromagnetic and Emission Control decision criteria.

- **Battle Force/Group Tactical Action Officer** (TAO) on 8 aircraft carriers, TAO Instructor for 4 years, 20 months combat experience.

### Recent Positions
### at ImagineCBT Inc., ISIS Inc., Raytheon and Hughes Aircraft Company

**C4I Architect** and **C4I Support Plan Lead** for the Carrier for the 21st Century (CVNX) Task Order.
- Completed *CVX C4I Support Plan, v1.0,* Joint Operational Architecture development for Joint and Naval staff space allocations for CVX (1999) and Joint Command and Control ship (2002).
- Drafted *CVN 77 Electronics System Integrator Statement of Work (SOW)* for WBS Group 400 tasks and IPTs (1999), *Integrated Management Plan*; Royal Navy CVF WBS proposal (2002)

**Lead Systems Engineer, Operations Analyst** and **Site Survey Leader** for Saudi Arabian Minister of Defense National Operational Command Centers and C4I System (completed August 1997).
- Completed *System Specification, System Description Document, Site Survey, Interface Requirements Documents*

**Proposal Technical Volume Manager** for the following **winning proposals**:

- Vessel Traffic Service 2000 system, US Coast Guard command center for surface surveillance using radar, visual, communications links. (proposal evaluated A++, won Phase I, Phase II delayed then restructured)
- Anti-submarine Warfare Team Trainer (Device 20A66), an integrated, multi-ship, submarine and aircraft training system for Naval Task Groups. ($56M contract, best technical, lowest cost)
- Electronic Warfare Coordination Module, an Intelligence/EW spectrum planning and management system for Task Force Command Centers. (won Phase I, best technical)

**Assistant Program Manager for the Training Effectiveness Subsystem, Device 20A66**

- Performance Measurement Subsystem, observed real-time performance of operators, teams, multi-ship and aircraft units during exercises and compared to the standard

**Senior Systems Engineer** responsible for writing **specifications** in following **proposals**:

- Fire Support Combined Arms Team Trainer (FSCATT) *System Specification*, a US Army artillery multiple cannon and battery training system. (awarded $118M contract, still under contract)
- Warfighter's Simulation 2000 (WARSIM 2000) *System Specification*, a US Army Force XXI Century battalion to theater levels, and training system with actual C4I systems. (won Phase I)
- Tactical Combat Training System, *Exercise Execution Software Requirements Specification* (SRS) for simulation and computer models to run real-time, driving sensors, weapons and links on 35 ships, 100 aircraft and submarines (won Phase I contract, wrote SRS in Phase 2 proposal)

**Detailed Descriptions of Experience**

The following are more information, arranged chronologically, with dates, duration, position title, program name, followed by accomplishments, and then an overview of the project.

**April 2000 to present – ISIS, Inc., primarily as Senior Scientist, Information System Architect, Systems Engineer, Training Systems Analyst** and **Requirements Analyst.**

**General Accounting Office (GAO) (May 2005 – June 2006),** reviewed and prepared training system development and professional engineering services (PES processes and job descriptions for category 69 (training) proposal.

**Strategic Services and Support (April 2005-Sept. 2006),** attended pre-solicitation conference for the Army Communications-Electronics Command (CECOM), Ft. Monmouth, New Jersey, waiting for formal request for a part of this $19.25 billion program proposal.

**Department of Interior Management, Organization and Business Improvement Services (MOBIS) and Professional Engineering Services (PES) proposal analysis (June 2005),** prepared a detailed requirements and tasks analysis of the RFP) and proposal plan.

**Total Engineering Information Services (TEIS) (Feb. – March, 2005),** participated as proposal writer, pink and red team member with another company which is prime for an approximately $12 million, multi-year, contract for the Army Information Systems Engineering Command, Ft. Huachuca, Arizona. Prepared TEIS Risk Management Plan for prime contractor. Presently ISIS is waiting for announcement of selected winners.

**Networthiness Certification (Jan. 2005 – Sept. 2006),** prepared proposal for the Army Network Command (NETCOM), awaiting RFP to respond for this several million dollar program involving over 3,200 Army computer programs at all Army installations, worldwide. Prepared Quality Control (QC) and Risk Management Plan.

**Cryptologic Support and Logistic Analysis (Oct. 2004 – Sept. 2006),** prepared proposal for the Army Communications-Electronics Command (CECOM), Ft. Huachuca, Arizona, waiting for formal request for proposal.

**Information Warfare Training (2001 - 2005),** USAF Small Innovative Business R&D (SBIR) Phase I contract, to determine IW training requirements and measure performance in an

intelligence, wargaming system, awaiting possible award for development of an Information Warfare training system for the USAF Information Warfare Aggressor Squadron.

**US Army Virtual Proving Ground (2001-2002)** - Performed *C4ISR Architecture Framework* development, implementation and documentation using the DoD *C4ISR Architecture Framework, v2.0* and for Operational, Technical and Systems architecture products.

**Prepared C4ISR architecture framework proposals** for US South Command (USSOUTHCOM) Command Center (2003), DoD Threat Reduction Agency (DTRA) Operational Command Center at an Army Command, Virginia (2002), and Government Enterprise Architecture development for Department of Health and Human Services Command Center (2002) programs.

**Raytheon Naval and Maritime Systems,** San Diego, California, for various programs, a consultant for ImagineCBT, systems engineer.

**April 2001 to June 2005 – C4I Architect, Operations Analyst/Systems Engineer** for Minister of Defence (UK) Future Aircraft Carrier (CVF) program, Raytheon Naval and Maritime Ship Systems, San Diego.

Prepared for Raytheon Naval Ship & Integrated Systems (San Diego) proposals in April and June 2003 with Statement of Work (SOW), Data Item Descriptions (DIDs) and CDRLs for Architecture Assessments (Requirements, Testing) for ten functional mission areas, Global Information Grid Evaluations in order for CVF to be interoperable with US forces, and Levels of Information System Interoperability (LISI) using DoD LISI PAID (procedures, applications, infrastructure, data) attributes to determine internal and external interoperability assessments

Prepared proposal and performed contract for Raytheon C3I Systems (Fullerton, CA) for the Joint Command and Control Ship (JCC) *JCC Interoperability Study*, including report drafting and preparation, conference presentations and making recommendations to JCC Program Office for ensuring over 400 tactical, logistic, administrative, C4ISR applications work. (2001-02)

Prepared proposal and performed contract for Raytheon NAMS (San Diego) for *JCC Reconfiguration Study* to determine requirements to most effectively manage command (C4ISR) onboard JCC. (2001-02)

Provided architecture framework proposal inputs and evaluation for US Army Landwarrior III (Future Combat System) for Raytheon C3I Systems (Plano Texas)

Provided C4ISR and engineering analysis and proposal preparation for LHA(R), JCC, CVF and other Raytheon, San Diego ship programs (2000-03)

**October 2000 to present (inactive) – MBA Instructor, University of Phoenix,** for "Operations Management for Total Quality" and "Managing R&D and Innovation Processes" courses.

Taught these courses in Nogales to Mexican maquilladores managers and in Tucson to Americans managers.

Qualified to teach "Program Management" course.

Plan to qualify as FlexNet (online) Instructor, presently inactive instructor status.

**April 1998 to September 2000 – CVNX C4I Architect, C4I Support Plan Leader** also **Lead Systems Engineer** and **Requirements Analyst** for CVN 77 and CVNX Programs, at Raytheon, San Diego, CA

Performed C4I Support analysis to prepare requirements for the DoD C4I Support Plan. Led several teams to understand the *DoD C4ISR Architecture Framework*, v2.0 and Operational, Technical and Systems architecture products.

Managed team for CVN 77 requirements analysis 3 months to draft and submit plan to NAVSEA (PMS-378) for two customer reviews.

Provided interface to combine CVNX and Joint Command and Control (JCCX) Ship architecture development for NAVSEA (PMS-377), drafted task schedule but funding then not provided.

Proposed an approved Technical Instruction for "Reconfigurable Joint and Naval Staff Space Allocations" in order to start the CVX/JCC *Operational Architecture* and *Mission Essential Tasks* processes – completed early 1999. (3 of 14 proposed were approved for study)
Coordinated the AFCEA "Architecture Implementation Course" at the Raytheon San Diego site.
Created and drafted CVN 77 *Electronic Systems Integrator (ESI) Statement of Work (SOW)* for the CVN 77 ESI role and RFP in Spring 1999.
Provided trade studies and options for performing this task for Newport News Shipbuilding.
Established a draft CVN 77/CVX "Total Ship Systems Engineering (TSSE) Plan for our team.
Implemented the Raytheon and Newport News Shipbuilding *Integrated Product and Process Development* processes to structure IPTs, tasks, and work descriptions.
Provided interoperability inputs to UK Future Aircraft Carrier (CVF) Raytheon Qualification letter.
Participated in establishing teaming arrangements with SPAWAR Systems Center, San Diego.

The CVN 77 is the transition aircraft carrier from the *Nimitz* class, to be commissioned in FY 2008. Two other evolutionary aircraft carriers, CVNX-1 and CVNX-2 are to be commissioned in FY 2013 and FY 2018, respectively. The tenth CVNX is planned for disposal in FY 2111. Overall manning will be reduced up to 1,740 personnel. Up to 12 Joint, Naval, Combined and Coalition staffs may embark up to 1,000 augmentation personnel beyond the present capabilities. CVNX can embark a Joint (Task) Force Commander with command and control systems for Operational-Theater and Tactical (service) levels. The ESI role involves integration of all C4ISR equipment, internal and external communications, navigation, sensors, fire control, weapons, and associated display and processing systems.

**January 1998 to present – H&R Block, Tax Advisor Level 3,** seasonal tax preparer (annually, January to April 15), AARP Tax Consulting for the Elderly (pro bono) tax preparer, IRS qualified, over 450 hours of H&R Block classroom and CBT training courses.

**August 1997 to April 1998 – DD 21 Requirements IPT Lead, Systems Verification and Test IPT Lead,** and **Initial Lead Systems Engineer** for the Hughes, then Raytheon, DD 21 Program for NAVSEA, PMS-500 – assigned the CVX Reduced Manning (Automation) Study that led to CVX C4I Support Plan after Raytheon sent "no bid" letter in April 1998.
Provided IPPD plans for all systems engineering functions, including workshop participation, for subsystem to total Ship System levels.
Managed two Integrated Product Teams (IPTs), as additional DD 21 personnel were assigned.
Conducted a weekly VTC with IPTs, issued Agenda, Minutes, and led team meetings.
Attended Risk Management course and recommended Raytheon's Prophet™ risk management software tool for DD 21 and other integration programs.
Provided the initial *DD 21 Total Ship Systems Engineering (TSSE) Plan.*
Coordinated systems engineering modeling and simulation planning.

The Future Surface Combatant of the 21st Century (SC-21) Program consisted of both destroyers and cruisers, with the Land Attack Destroyer (DD 21) to be commissioned in FY2009 and an Air Dominance Cruiser in FY2018. I participated in the program implementation and maintenance of collaborative and synergy with both CVNX and SC-21 programs and the emergent JCC and USCG Deep Water Programs. [SC 21 is DDGX Program]

**June 1995 to August 1997 (26 months) – Operations Analyst** and **Site Survey Team Leader** also **Naval Operations Analyst** and **Joint Training Analyst,** *C4I System for National Defense Operations Center and Area Command Centers Definition Study* **- completed August 1997.**

Performed pre-contract planning analysis for site survey from battalion to national level.
Managed budget for 3 months deployment for the 12 engineers in Saudi Arabia.
Conducted interviews and briefs with members of all joint Minister of Defense and Aviation (MODA) staff and all armed forces, including schools and topographic commands.
Provided reports, program reviews and TGMIRs for survey and design efforts for the 2 years, including the coordination of all Action Items and Program Management Review Minutes.

Created significant inputs to the *System Description Document, System Specification* as Lead Systems Engineer, emphasized operational concepts including staffing and workstation operator tasks; operations center and support facility layouts; specifications for a transportable operations center (TOC); system-level communications interfaces including ATM, SATCOM, PTT and RF communications; system hardware and software interfaces including JMCIS, TADIL-S and IDL; operator training; selected over 100 formatted messages (using USMTF) for integration, and overall system performance characteristics.

Drafted System Specification for Land Forces Operations Center, deemed excellent by customer.

Prepared *Site Survey Report* and participated in drafting the *Communications Interface Requirements Document*, presented multiple customer briefs.

Only engineer to start and complete this contract (over $10M), most of the others were replaced.

The MODA C4I System will provide 13 operations centers, nation-wide, to form a joint service, C4I system, integrating the four services through 3 command echelons and, for the Land Force will provide their digital command and control system through 4 echelons.

**1995 – Systems Engineer, for an AirHawk Concept of Operations.**

Drafted a preliminary "*Operations Concept Document (OCD) for the Air HAWK*" system for HMSC, provided a systems approach to integrate the subsystems with the missile, for the Command and Control Division, using the MIL-STD-498(B) DID as a guide.

AirHawk provides an air-launch system capability for the U.K. Tomahawk cruise missile.

**1995 (five months) - Lead Systems Requirements Engineer, Warfighters' Simulation 2000 (WARSIM 2000), US Army training system.**

Performed system functional requirements analysis for command and control levels from battalion through echelons above corps and Theater-levels

Responsible Engineer for the analysis and writing of the system specification for the entire system in accordance with MIL-STD-498(B) (System Engineering). (Hughes won Phase I)

WARSIM 2000 C4I training system to stimulate all present and emerging Force XXI digital C4I systems with operational data for entire staffs in their Tactical Operations Centers in the field, in classrooms and at the War Colleges. WARSIM 2000 integrates with other joint systems through protocol standardization and object-oriented design features.

**1994 – System Requirements Compliance Engineer, Theater Battle Management Core System (TBMCS), US Air Force C4I system.**

Ensured compliance with the contract and requirements documents integrating different systems into the TBMCS proposal, including the Global Command and Control System.

Drafted a compliance matrix with 200 pages in the Executive Volume to meet demanding RFP compliance requirements (Proposal vs. IFPP vs. SOW vs. CDRL vs. WBS vs CLIN vs. TRD).

TBMCS is the US Air Force Theater to squadron level C4I system. (Hughes lost)

**1994 (seven months) – Proposal Technical Volume Manager for the Vessel Tracking Services 2000 (VTS 2000), US Coast Guard C3 system.**

Led the technical and engineering proposal efforts to comply with the RFP and proposal requirements, based on Hughes themes and proposal strategy decisions.

Managed systems, hardware, communications, software, and logistics engineers writing the responsive proposal. (Ten corporate teams bid; Hughes won Phase I with two others including Raytheon, Hughes performed Phase I, Congress delayed Phase II, program later restructured)

VTS interfaces radar, visual surveillance, environmental, and voice communications data with differential Global Positioning System (dGPS) information from automated and human input to enhance safety and commerce on waterways and for major port regions.

**1993-1994 (ten months) – Lead Systems Engineer, Fire Support Combined Arms Tactical Trainer (FSCATT), US Army training system.**

Team Leader for the requirements analysis, design, and system engineering and proposal efforts. Drafted and led several pre-RFP System Requirements Reviews for the System Specification. Developed a technique with Distributed Interactive Simulation (DIS) protocols whereby a thousand or more cannons can perform exercises from multiple sites in same exercise.

FSCATT integrates artillery and fire control with a Forward Observer visual training system, provides Fire Direction Center simulation and stimulation interfaces with Close Combat Team Trainer (CCTT) M1 tank and M2 systems. (Hughes won $118M program, still ongoing)

**1990-1991 (20 months) – Systems Requirements Engineer, Tactical Combat Training System (TCTS), US Navy C4I training system.**

Led the simulation and modeling, system requirements analysis for all real-time operations for the proposal and Phase I development efforts. (Hughes won Phase I)

Wrote most of the *Exercise Execution CSCI SRS* for real-time system execution software for all simulations and sensor, weapons and platform models (over 100).

TCTS provides a task group training data link for 100 aircraft, 24 ships and submarines, 6 ashore installations and ranges, with real-time targets (to 780). TCTS uses participant "pods" with a data link between platforms; stimulates platform sensors with the real-time targets; maintains data link communications; collects data for feedback and rapid after action reviews. (Hughes team won Phase I, Raytheon Phase II)

**1991 - Human Factors SE for Land Warrior 2000 proposal, US Army infantryman C4I system.**

Human Factor Engineer for proposal effort for the helmet display overload analysis with computer text and graphic display resolution. Left to lead FSCATT Systems Engineering and Proposal teams.

Land Warrior 2000 system provides infantrymen with an integrated C4I System for an infantry brigade, with computer-driven displays, messages, GPS, and other C2 features. (Hughes won)

**1988-1991 (4 years) – Assistant Program Manager for the Training Effectiveness Subsystem, Device 20A66.**

Created Performance Measurement Subsystem, used subcontractor to provide analysis, documentation, and design details.

Managed subcontract ($1.2M), conducted subcontractor reviews, wrote SOWs, evaluated products and a subcontractor.

The Performance Measurement Subsystem determines operational performance (real time) for trainees from Admiral to sensor operators and for ship teams, multi-ship and tactical units.

**1988-1991 (4 years) – Senior Systems Engineer, Device 20A66.**

Lead Systems Engineer, provided significant inputs for models, simulations, communication data link interfaces, user displays, and I/O; consultant to software team as ASW expert.

Designed to real-time Links 4A/11/16 with ships in port and ships/aircraft at sea.

The Device 20A66 trains a Battle Group Commander in a Task Force Command Center (TFCC), staff and subordinate staffs (in 20 ships and submarines and 15 aircraft in 35 mockups using 186 different workstations with 61 large screen displays) to use data links, communications, and good decision making practices.

**1986-1988 (1.5 years) – Proposal Technical Volume Manager, Device 20A66.**

Evaluated Draft-RFP and System Specification, provided 229 change pages, and was acknowledged to be most significant pre-proposal action by any bidding contractor.

Led pre-proposal, technical design and development effort as the only engineer for 1 year.

Led, as Technical Volume Manager, team of systems, simulation, hardware, courseware, facility, logistics and software engineers in the synthesis and drafting of the 500-page technical volume, with final technical volume cost less than B&P estimate.

After proposal submittal, replied to questions, gave briefs. (Hughes won, beat 2 incumbents)

**1987-1988 (6 months) – Proposal Manager, California Law Enforcement Driver Trainer System**
Led pre-proposal and proposal team to develop a design for high-technology driver trainer systems for the Peace Officers and Safety Training (POST) Commission. (Hughes won)
Participated during contract, as systems engineer in-charge of design, to verify the POST training objective(s), standard(s) and criteria would be met for the drivers of the system.

**1987 (4 months) – Lead Engineer, Advanced Fuels Auxiliaries Test System for USAF**
Provided initial engineering requirements analysis leading to joint venture with Allison Gas Turbines to bid this major USAF test system.
Drafted initial System/Subsystem Design Document, the basis for design.
Hughes bid, after I left project; however, USAF declined to award contract.

**1986-1987 (3 months) – Proposal Coordinator, USAF LANTIRN training system.**
Led proposal compliance review for real-time video and infrared technical requirements using the Hughes RealScene™ 3-dimensional (voxel-based), interactive system instead of the Hughes (formerly Honeywell)-developed, GBU-15 training system.
LANTIRN trainer provides real-time displays of video and IR images to cockpit and weapons systems for F-15, F-16 flight simulators and the AGM-130 missile. (Hughes no-bid)

**1985-1986 (9 months) – Senior System Engineer for the Electronic Warfare Coordination Module (EWCM) program with responsibility for the environmental effects design.**
Led technical proposal effort, coordinated proposal outline, reviewed storyboards and topics, determined compliance, edited technical volume, and synchronized with other volumes.
Responsible engineer for atmospheric and acoustic effects on propagation and degradation from countermeasures, provided customer briefs and proposal topics.
EWCM provides full spectrum management capabilities for the Electronic Warfare Commander to coordinate operational and intelligence EW information and databases. (Hughes won Phase I, lost Phase II)

**1982-1985 (2.5 years) – Systems Engineer for the training subsystem, Device 14A12 ASW Tactical Ship Training System.**
Led technical proposal effort for the Performance Measurement and Monitoring training subsystem, sonar modeling and simulation, operator displays, fire control, data links, and sensor, weapon and platform modeling.
Designed PMM subsystem, pushing the state of the art, later implemented in Device 20A66.
All ASW ships and ASW aircraft were simulated in a single-ship, multi-dimensional (anti-air, anti-surface, anti-submarine) environment, as a C2 and sensor operator training system.

**Papers**

Presented papers to the Industry/Inter-Service Training Systems Conferences (I/ITSC):
"Design Concepts for a Performance Measurement System" [nominated for best paper top 5 of 105]
"A Performance Measurement System Design", based on Device 20A66 results.
Prepared and presented three reports to the National Security Industrial Association (NSIA), ASW Committee, as Vice-Chairman of Training and Interoperability Subcommittee; Study Leader for following Reports:
"Training Commonality for Oceanography and Acoustic Environment Study Results"
"Training Commonality for Detection and Classification Study Results"
"Proposed Standard Sonar Equation for Technical, Tactical, and Training Communities"
Received NSIA Meritorious Award for leading these ASW industry and government studies)
Presented paper to the Hughes Advanced Technology and Studies Group describing the use of "Distributed Interactive Simulation (DIS) Protocols in C4I Systems".

**Raytheon and Hughes Aircraft Company Courses**

**Taught** "Introduction to ASW Tactics" course, at Hughes (four times) and for the *Advanced Training Institute* at Naval Underwater Systems Center (New London and Newport RI) 10 times at the Naval Surface Weapons Center (White Oak), Naval Civil Engineering R&D Center (Oxnard), and others.

**Attended** "C4I Architecture Implementation" (4 days, AFCEA Course), "Risk Management" (3 days), "Front-End of the Business" (1 week), "Systems Engineering" (HITS/HMSC processes), "Global Command and Control Seminars" (APL)

**Attended ATEP Courses**:

Software Risk Analysis, Software Estimating and Prediction, Database Modeling, Object-Oriented Software Methodologies, Proposal Development, How to Interview Candidates, Microsoft Word, Creating a Web Browser, Netscape User's Courses

**Participated** in the NSIA Industry War Games at Naval War College (Newport RI) and Marine Corps Command and Development Center (Quantico).

**Military Schools**

Attended US Naval schools including Destroyer School Department Head Course, Gunnery Officer, Anti-submarine Warfare (ASW) Officer, Communications Security (COMSEC), Naval War College Wargaming Course, and Naval Tactical Data Systems User Courses.

**Military Qualifications**

Qualified for Command of Destroyer, Tactical Action Officer (Battle Group and Warship), Officer of the Deck (cruiser and destroyer), Ship Command Duty Officer, and Surface Warfare Officer.

Proven Subspecialist (post Master Degree) in Geophysics, Oceanography, and ASW Systems Technology, Board selected (about 10 in each of these subspecialties per year in US Navy).

**Significant Military And Operational C4i Experience**

Active duty commissioned officer in the US Navy serving in the following assignments (home ported twice with each of the four fleets):

Area ASW Force, Sixth Fleet (CTF 66) as Staff Plans Officer coordinated all surface ships, aircraft carriers, submarines and ASW/EW aircraft in the Sixth Fleet area on a daily basis; conducted operational ASW with real targets; coordinated (simulated) daily submarine, surface ship and air-launched anti-ship Harpoon attacks on targets. (Awarded Meritorious Service Medal for highest Fleet-level ASW performance ever)

Fleet ASW Training Center, Pacific Fleet, the lead Coordinated ASW Tactics Instructor and Staff Oceanographer, and at sea as an Anti-Submarine Warfare Commander Instructor and ASWC Watch Officer during Fleet Exercises, augmenting Destroyer Squadron staffs. Also taught coordinated ASW tactics at Fleet Combat Training Center (Point Loma) as a guest instructor to TAO classes for three years.

Commander Carrier Group Three, as staff ASW Surface Operations and Geophysics/ Environment Officer, deployed twice to Western Pacific and Indian Ocean; planned and conducted RIMPAC 77 with Japan, Australia, New Zealand, and Canadian ships, 3 aircraft carriers, 7 submarines and over 150 aircraft; planned Persian Gulf CENTO MIDLINK-77 with UK, Iran and Pakistan; qualified as Battle Force TAO on 5 different aircraft carriers.

Naval Surface Warfare Officers Schools Command/Naval Destroyer School as the ASW Tactics and TAO Instructor for Prospective COs, XOs, Department Heads and Free World Navies Courses for mid-grade officers from over 30 countries; co-developed Naval Tactical Analysis Wargame and used it to evaluate tactical concepts including Harpoon anti-ship tactical development; used ASW team and sonar trainers for exercises; trainers for anti-PT boat interactive team exercises; taught anti-submarine/anti-surface warfare tactics, EW, communications, and EMCON decision making classes. Taught surface ship ASW at Submarine School was a guest instructor at the

Naval War College and used the War College wargaming facilities to evaluate new systems and ship classes being designed by NAVSEA. (Awarded Navy Commendation Medal with Gold Star)

Commander Cruiser-Destroyer Flotilla Ten, as ASW Plans Officer, deployed to Sixth Fleet, embarked on 3 aircraft carriers and 2 cruisers including USS *Albany*. Planned and executed many Sixth Fleet and NATO exercises and a CENTO air defense exercise. Engaged in more than 50 Soviet bomber over-flights of the Battle Group, 100% successfully intercepted by fighters and missile lock –on prior to 100 miles from the aircraft carrier. (Awarded Meritorious Unit Commendation for validating anti-SSBN tactics and developing SSN direct support procedures)

USS *Hollister* (DD788), Operations Officer, deployed for 2 years, 19 months of consecutive combat operations off Vietnam in the Seventh Fleet, provided naval gunfire support (over 28,000 5/38 rounds), maritime surveillance, SAR, *Gemini VIII* NASA space craft rescue ship, and EW intelligence gathering and Korean operations. (Awarded Secretary of Navy Unit Commendation, Navy Commendation Medal with Combat "V")

USS *Robert L. Wilson* (DD748), ASW Officer, deployed to Sixth Fleet for ASW operations, UN rescue ship off Cyprus, NATO exercises, *Gemini IV* NASA space craft rescue ship, participated in the Dominican Republic operations. (Armed Forces Expedition Service Medal)

USS *Springfield* (CLG7), Main Battery Fire Control Officer and Missile Fire Control Officer, deployed in the Sixth Fleet Flagship, home ported in Villefranche-sur-Mer, France.

**State of Arizona, Industry Association, Company, and Military Awards**

Arizona Secretary of State "Arizona Golden Rule Citizen Certificate" and plaque from Janice K. Brewer, Secretary of State, for "exemplifying the spirit of the Golden Rule daily: "Treat others as you would like to be treated", nominated by former Santa Cruz County Supervisor Ron Morriss, for his work as a voluntary Energy Commissioner and his work for the county before the Arizona Corporation Commission. (2004)

National Security Industrial Association. (NSIA) Anti-Submarine Warfare Committee, Meritorious Award from the NSIA President, Admiral Hogg USN (Ret.), for leading several ASW training industry and government studies. (1992)

Merit Awards. Raytheon and Hughes, four times, for achievement and excellence in performance.

Military Awards include Meritorious Service Medal, Naval Commendation Medal with Combat "V" and Gold Star, Navy Unit Commendation, Navy Meritorious Unit Commendation, National Defense Medal, Armed Forces Expeditionary Medal (Dominican Republic), Vietnam Service Medal with three Bronze Stars, Vietnam Campaign Medal with "1960-", Overseas Service Ribbon (Italy).

**Security Clearance**

Secret (have held higher), last updated 2005, at ISIS, Inc.

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