



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

MAY 25 1984

Docket No.: 50-482

Mr. Glenn L. Koester  
Vice President - Nuclear  
Kansas Gas & Electric Company  
P. O. Box 208  
Wichita, Kansas 67201

Dear Mr. Koester:

Subject: Operating Shift Staffing for Wolf Creek

In response to a request from the Commission, the NRC staff has been tasked with performing a special review of the operating shift staffing for each nuclear plant approaching an operating license decision. The objective of the review is to assure that the operating shift crews have adequate previous "hot" operating experience. In cases where this experience is not available within the ranks of the licensed plant operators, such that shift advisors must be used, the review is to assure the adequacy of the shift advisor qualifications.

The criteria against which the crew experience will be reviewed are contained in the proposal by the Industry Working Group, presented to the Commissioners on February 24, 1984, by Mr. J. H. Miller of Georgia Power Company and Mr. D. F. Schnell of Union Electric Company. A copy of the industry proposal is enclosed (Enclosure 1). The staff has recommended that the Commission accept the industry proposal subject to the following:

1. With regard to the shift crews that meet the industry experience proposal:
  - a. The Hot Participation Experience tabulated in Mr. Miller's slide 5 (Operating Shift Experience Requirements) should be at a large, same type plant.
  - b. The use of an SRO-licensed STA to satisfy the Hot Participation Experience is acceptable provided that the STA serves as a member of the shift.

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MAY 25 1984

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2. With regard to the use of shift advisors:
  - a. The shift advisors that have at least one year on shift as a licensed SRO at an operating plant of the same type are acceptable. Proposals to utilize an individual as an advisor who has only an RO license will be evaluated on a case-by-case basis to assure that an appropriate level of knowledge and supervisory experience has been accumulated.
  - b. The utility-administered examinations for advisors should include both oral and written examinations. If no plant-reference simulator is available, a board of at least three individuals, qualified at the SRO level, should conduct the oral examination.
  - c. The utility should provide the NRC with a list of certified advisors and their qualifications. The NRC staff should be notified one month prior to their release.

We are in receipt of your March 12, 1984 letter to Mr. Denton which summarized the experience levels of your operating crew personnel. In order to perform our review, we need confirmation that the data presented in your March 12, 1984 letter is still correct, together with an explicit statement as to whether you do or do not plan to use shift advisors to augment the operating shifts. In addition, if you do plan to use shift advisors, we need information as shown in Enclosure 2.

In order to support the Wolf Creek licensing schedule, the above information should be provided to the staff within one week of the date of this letter.

Should you have questions regarding this matter, the staff point of contact is Mr. L. P. Crocker in the Division of Human Factors Safety, who can be reached on 301/492-4891. This collection of information has been approved by OMB under OMB control number 3150-0011 which expires April, 1985.

Sincerely,

*Original signed by  
Darrell G. Eisenhut*

Darrell G. Eisenhut, Director  
Division of Licensing

Enclosures:

1. Industry Proposal
2. Information Requirements for Shift Advisors

cc: See next page

CONCURRENCES:

DL:LB#1 DL:LB#1  
PO'Connor:es BYoungblood  
5/2/84 5/1/84

DL:AD/L  
TMNovak  
5/2/84

DGE  
DGE Eisenhut  
5/2/84

DIST:

Docket File	LB#1 Rdg	ACRS 16	LCrocker
NRC PDR	MRushbrook	EJordan	
Local PDR	PO'Connor	NGrace	
PRC System	FIELD Attorney		

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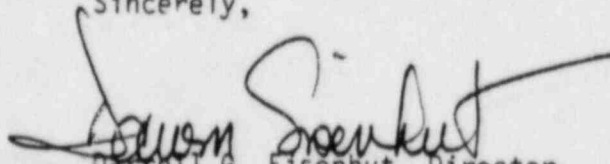
2. With regard to the use of shift advisors:
  - a. The shift advisors that have at least one year on shift as a licensed SRO at an operating plant of the same type are acceptable. Proposals to utilize an individual as an advisor who has only an RO license will be evaluated on a case-by-case basis to assure that an appropriate level of knowledge and supervisory experience has been accumulated.
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Darrell G. Eisenhut, Director  
Division of Licensing

Enclosures:

1. Industry Proposal
2. Information Requirements for Shift Advisors

cc: See next page

WOLF CREEK

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INDUSTRY EVALUATION OF  
OPERATING SHIFT EXPERIENCE REQUIREMENTS

BY: J. H. Miller, Jr.  
President, Georgia Power Company

For: NRC Commissioners  
11th Floor Conference Room  
1717 H. Street, Northwest  
Washington, D.C.

~~84-0517-0340~~

February 24, 1984

## INTRODUCTION

Good afternoon. Chairman Paladino, Commissioners, Staff Members and fellow utility representatives. My name is J. H. Miller, Jr. and I appreciate the opportunity of addressing you today. As the President of Georgia Power Company, I have a great professional and personal interest in the future of the nuclear industry. Georgia Power has committed major resources to nuclear generation and currently has a two-unit BWR in commercial operation and a two-unit PWR under construction scheduled for a 1986 startup. In addition, I serve as the Chairman of the Association of Edison Illuminating Companies Committee on power generation. Today, however, I am acting not only as a representative of Georgia Power Company, but also as an industry representative for utilities with current NRC Operating License Applications on the subject of operating shift experience. The list of utilities which support our position is included in your handout. At this point, I'd like to introduce several utility executives who have expertise associated with shift operating experience levels.

Hal Tucker, VP Duke Power

Cordell Reed, VP Commonwealth Edison

Don Schnell, VP Union Electric

In addition, a number of executives from utilities seeking an operating license are members of our audience, and several executives from other utilities who have interest in nuclear operations are also present.

#### PERSPECTIVE

Before presenting the industry position on operating shift experience, I want to put the issue in proper perspective. Past operating experience is only one component in the qualifications of operators. Other components that all of us commit substantial resources to involve selection of very talented individuals to be operators, extensive formal classroom education and training, observation and participation at similar nuclear plants away from our service areas, professional simulator training on normal evolutions to develop proficiency and on abnormal evolutions that can not be experienced at an operating plant, direct involvement of our operations personnel in own plant testing and hot functionals, demanding written and oral examinations administered by both the utilities and NRC, extensive requalification training including examinations and simulator retraining and continuing management involvement to assure that our qualification programs provide high quality professional operators to help assure protection of the health and safety of the public and the environment.

To highlight our continuing extensive commitment to having very professional operators manipulate the controls of our plants, I will briefly describe some of the elements of Georgia Power's Plant Vogtle operator qualification program.

This program is typical of NTOL's. Recently Georgia Power interviewed and tested more than 400 applicants for positions that lead to operator licensing. Less than 8 percent of the applicants passed our selection testing and only 5 percent were interested in operator jobs after shift requirements were explained. This selection process results in the retention of people with the special talent to become operators. But it is only the first step in a long process. The Plant Vogtle Training Center has more than 40,000 sq. ft. dedicated to training. This modern facility supports comprehensive classroom training programs for our operators. Even Georgia Power's four year degreed engineers who are scheduled to be licensed for the startup receive more than 600 hours of classroom instruction in the fundamentals of nuclear theory and Vogtle Plant system operation. Our programs are demanding and our examinations are tough. To date we have removed 30% of the initial class of degreed personnel from our operations programs for failing to meet our standards.

Plant specific simulator training on the Vogtle simulator will have been used by Georgia Power to develop operator knowledge and proficiency during the four years prior to fuel load. Our Vogtle specific simulator has been in operation since mid 1982. Extensive participation training and experience has started for our operators at similar operating plants. These programs are structured and scheduled to ensure that our operators will be involved with the important aspects of hot experience. Then, our operators return to Plant Vogtle to directly participate in the extremely valuable preoperational testing program. Operators manipulate controls of Vogtle



equipment when plant systems are first placed in service. When equipment is started for the first time, problems are encountered and resolved. Having our operators involved with test supervisory personnel provides the startup experience to our operators and enables them to receive hands-on experience to become intimately familiar with Vogtle specific equipment and systems. Further, during this period the operators will use and correct procedures which they helped develop. In fact, our procedure development effort will first check out our procedures by having our operators use them on the simulator before they are used in the plant.

Like other utilities, Georgia Power feels that we have structured a very comprehensive qualification program for our operators. When completed, Georgia Power will have operators who know how to manipulate Vogtle controls to produce power safely and efficiently.

With that perspective, I am now going to present the industry position concerning the much narrower issue of operating shift experience.

#### BACKGROUND

During the past few months, the NRC expressed concern over the operating shift experience levels for Near Term Operating License (NTOL) plants.

(SLIDE 1 BACKGROUND)

Such concerns led to a NRC staff meeting with the NTOLS on January 26, 1984. As a result of that meeting 33 representatives from 21 utilities met at INPO in Atlanta on February 2 to discuss operating shift experience. During this meeting an Industry Work Group was formed which consisted of 16 representatives from 15 utilities. The mission of the Industry Work Group was to define components of operating shift experience and establish acceptable methods of meeting this experience. The group also reviewed the availability of the industry's licensed personnel and evaluated the potential effects of implementing the NRC staff objectives, provided in the January 26 meeting in Bethesda. After accomplishing its mission, the working group presented its findings to representatives of the NTOL companies.

PURPOSE

(SLIDE 2 PURPOSE)

My purpose in addressing you today is to present the industry position on the level and type of operating shift experience required for the safe startup and initial operation of a nuclear generating plant. In order to do this, I will discuss the various considerations examined by the group in light of the NRC Staff Objectives.

There are several general areas which I will address in considering shift experience. These are: first, elements of experience; second, types of nuclear experience and weighting factors; third, operating shift experience requirements, and finally, evaluation of staff objectives.

#### PLANT SHIFT EXPERIENCE CONSIDERATIONS

(SLIDE 3 ELEMENTS OF PLANT EXPERIENCE)

A way to describe shift experience necessary to startup a nuclear power plant and place it in service is to consider five elements of experience.

First, licensed members of the operating shift must have experience with power plant machinery and controls; but it is not necessary for that type of knowledge and experience to be gained only in nuclear power plants. Much of the equipment in a large nuclear power plant is very similar to that used in other power plants. Very valuable power plant equipment experience can also be gained through preoperational testing of equipment at the operators' own nuclear power plant. Military plant experience also provides a good base for hands-on equipment experience.

A second element of experience, which is considered essential is knowledge of the plant-specific layout and design parameters. Participation in the preoperational test program using plant specific procedures and equipment is an excellent way to assure thorough plant and equipment knowledge. This is the preferred way to obtain such experience.

Third, licensed operators should be able to respond quickly and effectively to plant transients. We believe that the most effective way shift crews can acquire this skill is through the use of plant simulators. The reason is that many transients can be simulated and resimulated in a short time; unlike "hot" plant experience where, in one year, relatively few transients might occur while personnel are on shift. Even time spent on a non-plant specific simulator can provide valuable experience in reacting to transients. Furthermore, simulators are the only way operators can be trained to react to and correctly handle many transients which would not be possible to schedule during plant operation.

Fourth, previous experience in a highly-disciplined, tightly-controlled environment is important in assuring shift competence. Licensed personnel should acquire and demonstrate skill working within the confines of a tightly-controlled plant, including technical specifications, procedures, quality assurance and radiation protection. Obviously, working on shift at an operating commercial plant would establish this experience. But this is not the only way; experience can also be gained at military and other reactors.

Fifth, an SRO must have supervisory experience in managing events and people. Although this experience can be obtained at a nuclear plant, it can also be obtained in the military, and to a great extent, from other plant supervisory experience.

Finally, these elements of plant experience when combined in a shift team provide effective nuclear shift management. This shift team experience concept is much preferred to the one-man concept of plant "experts".

#### NUCLEAR EXPERIENCE AND WEIGHTING FACTORS

(SLIDE 4 -TYPES OF NUCLEAR EXPERIENCE AND WEIGHTING FACTORS)

We believe that some types of experience are more effective in helping to provide operating competence than others. To appropriately combine different types of nuclear experience, the Industry Working Group developed weighting factors and a method of applying them to experience. The formula is:

Nuclear Experience = (Type of Nuclear Experience ) x (Weighting Factor)

Following my presentation Don Schnell will present the details of and background of the weighting factors. The Working Group considered the full range of experience and the more significant types of nuclear experience were listed on this slide.

## OPERATING SHIFT EXPERIENCE REQUIREMENTS

(Slide 5 - OPERATING SHIFT EXPERIENCE REQUIREMENTS)

Slide 5 shows the experience that the License Applicants consider would help assure protection of the health and safety of the public and environment. The experience figures were derived in part from appropriate elements of ANS 3.1-1981 supplemented to provide a practical solution to the "Hot" experience concern. It requires a minimum of 13 years total power plant experience and six years nuclear plant experience on each shift. By applying experience factors that Mr. Schnell will describe, the industry's position is that each shift will have the experience competence necessary to provide a high level of operator proficiency. Further, as the unit operates over time, the people on shift will become more and more experienced. Their performance will, in the normal course of business, be monitored by the plant management so that their competence should improve with operation of the unit.

### SHIFT ADVISOR

For many of the near term plants, the NRC has required that an experienced advisor be assigned to each shift. This advisor was to augment the utility organization until suitable experience could be developed by the utility staff. To strengthen the advisor role and to provide an approach to replace advisors with utility personnel, the industry has developed the following.

Advisors will have standard qualifications which include previous "Hot" licensed experience, and utility training on the unit to be started up. There will be a clear definition of the advisor's duties. They will be experienced people and will receive formal training as required, with specific training about their duties and responsibilities, and the shift crews will also receive training on the advisor's duties and responsibilities. They will not perform licensed operator duties unless they are licensed on that specific reactor. Mr. Schnell will also present the details of the advisor qualifications and duties.

#### EVALUATION OF STAFF OBJECTIVES

(SLIDE 6 - NRC STAFF OBJECTIVES)

The Industry Working Group has reviewed the NRC Staff Objectives and considered their potential impact on the industry. We do not agree that meeting these objectives would necessarily improve the safety margin of the industry's plants.

(SLIDE 7 - EFFECT OF NRC STAFF OBJECTIVES)

We believe that meeting the staff objectives would result in a large movement of licensed personnel from operating plants to NTOL plants which would obviously dilute the operating plants' level of shift expertise. Alternatively, the movement of some of the license candidates in training at NTOLs to operating plants for the purpose of undertaking a long license/experience program would cause those candidates to miss important

portions of preoperational testing at their home plant. This loss of preoperational test experience would in our opinion reduce the margin of safety for plants in startup. The overall margin of safety for both operating and startup plants would therefore be adversely impacted.

Also, plant startups could be delayed by the need to acquire, train, and license people not previously identified to fill the shift experience levels specified in the staff objectives. This would result in very large capital costs without apparent offsetting benefits.

#### SUMMARY

In summary the owners and operators of nuclear power plants with current NRC Operating License Applications are committed to providing a high level of on-shift operating experience. This will help assure safe operation of our plants.

(SLIDE 8 - SUMMARY)

We endorse stated experience requirements shown in the previous slide #5 which Mr. Schnell will discuss. In addition, we recognize the need for defining the types of experience contributing to fulfilling such requirements and we plan to use weighting factors as Mr. Schnell will also discuss.



We plan to provide two SROs per shift, one of whom has at least six months of "Hot" participation. For those plants that cannot provide the "Hot" participation requirements for SROs, a qualified advisor would be used until such time as their shift personnel are qualified. Of course, these advisors would be trained as Mr. Schnell will describe. The shift crews will also be trained on the duties and responsibilities of such advisor.

Further, we would like to eliminate advisors by meeting the stated shift experience levels with our own people within three years of acceptance of this position by the NRC.

To conclude, each of us has a large investment in our facilities. We are addressing today the subject of operating shift experience. This is only one component in the lengthy, complex, and demanding job of qualifying our operators. Each of us is determined to place these units in operation safely. We believe that the position we have outlined today will accomplish our mutual goals and will result in improved safety margins, and help assure the protection of the health and safety of the public.

Don Schnell V. P. Nuclear, Union Electric Company will present Nuclear Operating Experience Requirements, Plant Experience Weighting Factors and the Shift Advisor qualifications.

INDUSTRY EVALUATION OF  
OPERATING SHIFT EXPERIENCE REQUIREMENTS

SLIDES

BY: J. H. Miller, Jr.  
President, Georgia Power Company

For: NRC Commissioners  
11th Floor Conference Room  
1717 H. Street, Northwest  
Washington, D.C.

February 24, 1984

## BACKGROUND

DATE	EVENT
January 26	<ul style="list-style-type: none"><li>• NRC Staff Meeting with NTOLS to Present Objectives</li></ul>
February 2-22	<ul style="list-style-type: none"><li>• Operating Shift Experience Meetings Held</li><li>• Industry Working Group Formed</li><li>• Utility Management Accepted Industry Working Group Findings</li></ul>
February 24	<ul style="list-style-type: none"><li>• Presentation to NRC Commissioners</li></ul>

## **PURPOSE**

Present industry position on the level and type of operating shift experience required for the safe startup and initial operation of a nuclear generating plant.

## **ELEMENTS OF PLANT EXPERIENCE**

- Power Plant Machinery and Controls
- Plant Specific Layout and Design Parameters
- Response to Plant Transients
- Highly Disciplined, Tightly Controlled Environment
- Supervisory Experience

# TYPES OF NUCLEAR EXPERIENCE AND WEIGHTING FACTORS

## FORMULA

Nuclear Experience = (Type of Nuclear Experience) × (Weighting Factor)

## TYPES OF NUCLEAR EXPERIENCE

SRO/RO Same Type Plant

SRO/RO Commercial Plant

Navy (Military) Plant

Simulator

Participation at Operating Nuclear Plant

License Training

Other Nuclear Experience

Degree

Experience on Own Plant

## OPERATING SHIFT EXPERIENCE REQUIREMENTS

Position	Power Plant Experience Years	Nuclear Plant Experience Years	License	Hot Participation Experience at Same Type Plant*		
				> 20% Pwr	Startup and Shutdown	6 Months on Shift
Shift Supv	4	2	SRO	6 weeks	X	Either
Sr Operator	3	2	SRO	6 weeks		SRO
Licensed Oper	3	1	RO			
Licensed Oper	<u>3</u>	<u>1</u>	RO			
Totals	13	6				

\*If any of the Hot Participation Experience requirements are not satisfied by the SRO's, a qualified advisor is required.

## **NRC STAFF OBJECTIVES**

1. At least one SRO on each operating shift should have a minimum of one year of hot operating experience on a similar type commercial plant at the SRO level
2. Eliminate use of technical advisors for meeting minimum shift crew experience levels
3. All SROs should have substantial hot operating experience as ROs at facility on which licensed or similar facility



## **EFFECTS OF NRC STAFF OBJECTIVES**

- Dilute Shift Experience for Operating Plants
- Result in Loss of Pre-Op Test Experience in Own Plant
- Delay Startup of Some Plants

## **SUMMARY**

### **INDUSTRY POSITION ON OPERATING SHIFT EXPERIENCE REQUIREMENTS**

- Follow Stated Experience Requirements for Operating Shift Personnel Shown on Slide 5 (Derived from ANS 3.1—1981)
- Use Weighting Factors in Assessing Experience
- Have at Least One SRO with Six Months "Hot" Participation at the Same Type Plant on Each Shift

—OR—

Provide a Qualified Advisor Until the Plant Staff Meets Stated Experience Requirements

NUCLEAR PLANT SHIFT EXPERIENCE

- o Operating Shift Experience Requirements
- o Experience Categories and Factors for Accumulating Nuclear Power Plant Experience
- o Shift Advisor Qualifications

Developed By

NTOL UTILITY WORKING GROUP

~~8405170343~~

Presented By

Donald F. Schnell  
February 24, 1984

## INTRODUCTORY REMARKS

DONALD F. SCHNELL

Mr. Chairman, Commissioners, by way of introduction, I am Vice President - Nuclear of Union Electric, and am responsible for design, construction, startup and operation of Callaway Plant, an 1150 MW PWR -- the lead SNUPPS plant. SNUPPS, you will remember, is the original multi-utility, multi-site plant standardization concept. I have been engaged full-time in responsible management positions associated with Callaway since the project was conceived in 1971, and have been directly responsible for plant operation since 1980.

In related industry activities, I am a member of the Nuclear Power Division Committee of EPRI and serve as Chairman of the Industry Review Group for INPO's Construction Project Evaluation Program.

Our Callaway Plant is within two months of readiness for fuel load, so it is fitting that I speak to you on this issue. Mr. Miller has described Georgia Power's program for selecting and training operating personnel; we at Union Electric also recognize our management responsibility to properly select and train operators so that Callaway Plant is started and operated in a manner which helps ensure public health and safety, while at the same time protecting our investment in the

plant. We expect Callaway to provide safe, reliable and efficient generation to our system; nothing less will be tolerated.

With this goal in mind, we have selected an outstanding group of operator candidates who, though light in commercial nuclear plant experience, have already demonstrated their competence and reliability in activities leading to plant startup. To prepare our operators for this heavy responsibility, we have assembled a training staff of superior individuals and have invested in an on-site training center which includes a Callaway Reference Simulator. The simulator has been in operation at Callaway since mid-1982; a Callaway/SNUPPS simulator has been operational and available to our personnel since 1979 at the Westinghouse Training Center. We have also sent our SRO/RO candidates to operating plants for participation training. They have assisted in preoperational test activities at Callaway and have had shift responsibility for our hot functional test program. I am convinced we have prepared these people to handle the responsibility of operating Callaway Plant.

Notwithstanding this, the staff as well as the ACRS have required the addition of advisors to supplement our shift experience base. We committed to add shift advisors in 1981 and have relied on this concept to satisfy NRC's concern over the commercial experience issue. I might also point out that we have intentionally avoided soliciting operations personnel away

from other utilities with operating plants, believing this practice to be outside the best interests of the industry.

With this personal background, I will now present to you the plan developed by our working group to assure a responsible level of Shift Operating Experience.

- Slide illustrates experience requirements of the four licensed shift positions: Shift Supervisor (SRO), Senior Operator (SRO), and two Licensed Operators (RO's).
- Experience requirements: Derived from ANSI/ANS-3.1-1981, with additional hot plant shift time within assigned crew.
- Power Plant Experience: As defined in ANSI/ANS-3.1-1981. Assures minimum of 13 years per shift crew.
- Nuclear Plant Experience: Equivalent experience derived from 10 categories of applicable experience, with specific weighting factors and maximum time credited to each category. Assures minimum of 6 years equivalent experience per crew.
- Hot Participation Experience: Defined as direct involvement in review and discussions leading to decisions relative to operation of a commercial nuclear plant, or, direct hands-on operation as a trainee at a commercial nuclear power plant.
  - Includes: Six weeks participation in SRO/RO duties at an operating plant of the same type for Shift Supervisor and Senior Operator;
  - Shift Supervisor participation in reactor startup and shutdown at same type plant;
  - Six months participation in SRO/RO duties at an operating plant of the same type by the Shift Supervisor or the Senior Operator. (An SRO-Licensed STA may be considered an acceptable alternate for this experience factor.)
- Experience at "same type plant": Refers to commercial BWR or PWR
- Qualified Advisor: Must be on shift if any Hot Participation Experience factor is not satisfied by the Shift Supervisor or Senior Operator.

## OPERATING SHIFT EXPERIENCE REQUIREMENTS

Position	Power Plant Experience Years	Nuclear Plant Experience Years	License	Hot Participation Experience at Same Type Plant*		
				>20% Pwr	Startup and Shutdown	6 Months on Shift
Shift Supv	4	2	SRO	6 weeks	X	Either <i>2/3</i>
Sr Operator	3	2	SRO	6 weeks		SRO
Licensed Oper	3	1	RO			
Licensed Oper	<u>3</u>	<u>1</u>	RO			
Totals	13	<u>6</u>				

\*If any of the Hot Participation Experience requirements are not satisfied by the SRO's, a qualified advisor is required.



EXPERIENCE CATEGORIES AND FACTORS FOR  
ACCUMULATING NUCLEAR POWER PLANT EXPERIENCE

1. COMMERCIAL PLANT SRO/RO - SAME TYPE PLANT (BWR/PWR)

This experience category is applicable when the individual was assigned to licensed operator duties at a commercial nuclear power plant of the same type (BWR/PWR) as the one for which the operating license is sought.

Nuclear Plant Experience Value

Weighting Factor	1.00
Maximum Time Credit	No limit

Background

Actual hands-on experience at the same type (BWR/PWR) plant is essentially equivalent to the experience that would be acquired once the plant in question goes into operation.

2. COMMERCIAL PLANT SRO/RO - NOT FROM THE SAME TYPE PLANT

This experience category is applicable when the individual was assigned to licensed operator duties at a commercial nuclear power plant which is not of the same type as the one for which the operating license is sought.

Nuclear Plant Experience Value

Weighting Factor	0.75
Maximum Time Credit	No Limit

Background

Hands-on experience at a commercial nuclear power plant which is not the same type plant is assigned a weighting factor of 0.75 based on our working group's task-by-task comparison of the PWR/BWR control room operator job task data base available from INPO. Analysis of the data shows a 75% correlation between PWR and BWR tasks at the RO level and over 85% correlation at the SRO level.

3. NAVY (MILITARY) NUCLEAR OPERATING EXPERIENCE

This experience category is applicable when the individual was assigned in the positions discussed below at a Navy (military) nuclear power plant.

a. Navy Operating Experience

Nuclear Plant Experience Value

Weighting Factor	0.5
Maximum Time Credit	36 months

Background

This experience category applies to Navy watch positions such as Reactor Operator (RO), Engineering Watch Supervisor (EWS), Propulsion Plant Watch Supervisor (PPWS), and Engineering Officer of the Watch (EOOW). A comparison of control room operator tasks as compared to Navy nuclear operator tasks

was performed by the working group, with a correlation greater than 50% for both the PWR and BWR tasks listed in the INPO data base. Thus, a weighting factor of 0.5 is appropriate.

b. Other Navy Nuclear Experience

Nuclear Plant Experience Value

Weighting Factor	0.25
Maximum Time Credit	36 months

Background

Comparison of PWR and BWR control room operator tasks listed in the INPO data base with tasks performed by Navy personnel not directly in control of the reactor plant is more variable. Comparisons varied from 75% to 25% depending on the type of plant; therefore, a weighting factor of 0.25 is applicable.

Note

The maximum time credit allowed for a combination of a. and b. is 36 months.

4. FULL SCOPE NUCLEAR POWER PLANT SIMULATOR

This experience category is applicable for the actual time spent in the simulator control room in a structured training program including instruction, practice, and demonstration of competence in normal and abnormal operations.

Nuclear Plant Experience Value

a. Reference Plant Simulator

Weighting Factor	5.0
Maximum Time Credit	12 months

b. Similar Plant Simulator

Weighting Factor	3.0
Maximum Time Credit	9 months

Note

The maximum credit applicable when simulators of both types are used in a training program is 12 months.

Background

Simulators are generally accepted as an alternative to gaining actual operating experience. The training simulator affords the operator the opportunity to develop and demonstrate application skills. The full-scope nuclear power plant training simulator provides a means for obtaining, in a compressed time frame, extensive exposure to the full spectrum of plant operational evolutions and occurrences beyond that which could be gained through years of on-shift operating experience. Full credit experience equivalency has been demonstrated for training on simulators in other industry applications.

The reference plant simulator is presently recognized as equivalent to actual plant experience by the NRC staff and the industry in that these simulators have instrumentation and control configurations which reproduce the operator's own plant arrangement, they have operational characteristics modeled specifically from actual plant performance and/or

design data, and they allow direct use of the operator's actual plant normal, abnormal and emergency operating procedures. Training on the simulator can realistically demonstrate the shift crew's command and communication hierarchy. A 5.0 weighting factor is easily supported by the working group's study which indicated that, on a real-time basis, control manipulations take place on a simulator in a ratio of perhaps 400 to 1 when compared with actual plant control actions.

The NRC staff also recognizes the use of similar plant simulator certification programs in meeting operator license eligibility requirements. Although lacking the direct benefits a reference plant simulator affords in training, credit pertaining to similar type plant experience is valid. A 3.0 weighting factor for similar plant simulator experience has been endorsed by the Operator Licensing Branch of the NRC. We believe this weighting factor remains valid.

5. NUCLEAR POWER PLANT EXPERIENCE ON SHIFT AT OWN PLANT

This experience category is applicable when the individual is assigned on-shift SRO/RO duties at his own plant during the construction and testing phases prior to fuel load.

Nuclear Plant Experience Value

	<u>Weighting Factor</u>	<u>Maximum Time Credit</u>
a. Less than 1 1/2 years prior to fuel load	0.75	12 months
b. More than 1 1/2 years prior to fuel load	0.50	12 months

Background

To be a successful operator, an individual must have an intimate knowledge of the construction, layout and design of the plant and its equipment. He must know the physical location and relationships of each piece of equipment, piping routes, etc. This knowledge can only be gained by an extended assignment to the plant and is best gained by assignment during the construction and testing phases prior to initial fuel loading. During this period, the operator has access to all plant equipment. Operators assigned after the plant has commenced operation do not have such full access because of radiation restrictions.

During the year and a half period preceding fuel load, much system testing and equipment operation occurs; therefore, a weighting factor of 0.75 has been assigned.

Prior to this time, testing and equipment operation may be less frequent; thus, a weighting factor of 0.5 is assigned.

6. LICENSE CLASSROOM TRAINING AND EXAMINATION  
AT OWN PLANT

This experience category is applicable when an individual successfully completes a license training program including an examination for the license being sought. This experience is applicable to the classroom portions of the license training program. Simulator and on-the-job training are addressed in other experience categories.

Nuclear Plant Experience Value

Weighting Factor	0.5
Maximum Time Credit	9 months

Background

This contribution to experience consists of knowledge in nuclear power plant principles, systems and theory of operation. It is essential that a nuclear operator understands the theoretical and specific aspects of his plant. The license training program contributes to experience in areas of power plant equipment operation, plant specific design, plant transient behavior, plant technical specifications and regulations.

7. PARTICIPATION IN OPERATIONAL DUTIES AT AN OPERATING COMMERCIAL NUCLEAR POWER PLANT

This experience category is applicable when an individual has participated in operational duties at an operating plant. Participation is defined as either direct hands-on operation as a trainee or direct involvement in review and discussions leading to decisions relative to operation of a commercial nuclear power plant. Personnel assigned as equipment or auxiliary operators at operating plants would also gain experience under this category.

Nuclear Plant Experience Value

Weighting Factor	0.75
Maximum Time Credit	12 months

Background

Participation in operational duties provides significant experience. Involvement in plant operation provides an individual with knowledge of the regulated nuclear environment; i.e., radiation safety and ALARA, quality assurance, security, emergency plans, etc.

8. OTHER NUCLEAR POWER PLANT EXPERIENCE

This experience category is applicable when an individual has performed job duties related to design, construction, startup testing, maintenance or preoperational testing of any nuclear power plant.



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Nuclear Plant Experience Value

Weighting Factor	0.25
Maximum Time Credit	12 months

Background

Personnel involved in related areas of plant operation also gain experience of value depending on the specific job assignment. Such activities could include technical specification writing, writing or performing surveillance tests and/or operating procedures, design/installation of plant modifications, participation in preoperational system checkouts and hot functional testing, to name but a few. Through such activities in a regulated environment, personnel gain experience in the areas of radiation safety, exposure control, quality assurance, security, emergency planning and emergency response. They gain knowledge of nuclear plant concepts and technology simply by performance of their job duties.

9. CONDUCTING LICENSE TRAINING

This experience factor is applicable to those individuals who provide training in license training programs. This experience is applicable for individuals who provide this training on site or at any other facility.

Nuclear Plant Experience Value

Weighting Factor	0.25
Maximum Time Credit	9 months

Background

Instructors in licensed operator training programs gain a considerable depth of knowledge in nuclear theory and system operation. Some operational skills are also gained, depending on the individual's involvement with on-the-job training or simulator training aspects of the overall license training program. Recognizing that an instructor does not necessarily provide all elements of training and may not be involved in any hands-on training, the weighting factor is conservatively set as 0.25. A maximum credit of 9 months is allowed to account for the variety of instructor assignments.

10. DEGREE (ENGINEERING OR APPLIED SCIENCE)

This experience category is applicable for completion of degree requirements and credit for equivalent college work. For Bachelor's and Associate degrees, credit may be assigned as indicated. Experience credit for college work toward a degree may be assigned at the rate of one (1) month experience credit for each ten (10) semester hours college credit earned in engineering or applied science course work. The maximum credit assigned to this experience factor is 12 months.

Nuclear Plant Experience Value

Bachelor's Degree	12 months
Associate Degree	6 months
Degree Equivalent	1 month credit allowed for each 10 semester hours completed in technical subjects

Background

This contribution to experience is the exposure to fundamentals and principles of nuclear power plant operation. It is essential for a nuclear operator to become knowledgeable in the theoretical aspects of plant operation.

## EXPERIENCE CATEGORIES AND FACTORS FOR ACCUMULATING NUCLEAR POWER PLANT EXPERIENCE

EXPERIENCE CATEGORIES	WEIGHTING FACTOR	MAXIMUM CREDIT
1. Same Type Commercial RO/SRO	1.00	No Limit
2. Other Commercial RO/SRO	0.75	No Limit
3. Navy (Military) Nuclear (RO, EWS, EOOW, PPWS) (Other)	0.50 0.25	36 Months
4. Simulator (Reference Plant) (Similar)	5.00 3.00	12 Months (12 Months) (9 Months)
5. Nuclear Plant Experience on Shift (Own Plant) (Less than 1 1/2 Years Prior to F.L.) (More than 1 1/2 Years Prior to F.L.)	0.75 0.50	24 Months (12 Months) (12 Months)
6. Licensed Classroom Training and Exam (Own Plant)	0.50	9 Months
7. Participation at Operating Plant	0.75	12 Months
8. Other Nuclear Plant Experience	0.25	12 Months
9. Conducting License Training	0.25	9 Months
10. Degree (Engineering, Applied Science or Equivalent) (Bachelors Degree) (Associates Degree)		12 Months (12 Months) (6 Months)

1. MINIMUM EXPERIENCE

- a. Four years power plant  
As defined by ANSI/ANS-3.1-1981
- b. Two years nuclear power plant  
Equivalent nuclear experience as calculated for  
shift license positions
- c. One year on shift as a licensed SRO/RO at an  
operating plant of the same type

2. TRAINING PROVIDED BY UTILITY

- a. Extent to be determined by advisor's previous  
experience -- typically 4 to 8 weeks
- b. Program will include training in:
  - Plant Procedures, including administrative,  
normal/abnormal and emergency
  - Technical Specifications
  - Plant Systems
  - Simulator time, if available on site
- c. Examination to be administered and evaluated by utility

3. RESPONSIBILITIES/DUTIES

- a. Advisor responsibilities, authority and limitations  
will be clearly defined and included in his training
  - Shift crews will be trained to understand  
Advisor's function
- b. Responsibilities assigned by Shift Supervisor
  - Level typical of senior operator with commen-  
surate authority
  - Will not include assignments which require  
operator license
  - Will not include direction of licensed operators  
in assignments which require operator license
- c. Responsible to recommend appropriate actions to Shift  
Supervisor, including shutdown of unit
- d. Advisor will have direct access to management above  
Shift Supervisor to resolve disagreements which may  
affect safe operation of the unit

4. DURATION OF ADVISOR ASSIGNMENT

As a minimum, until utility personnel meet operating  
shift experience requirements

- Utility management will review shift crew  
experience base prior to releasing advisor
- May be influenced by previous license commitment

## **SHIFT ADVISOR**

### **1. EXPERIENCE**

- 4 Years Power Plant
- 2 Years of Which Is Nuclear Power Plant
- 1 Year Onshift at a Hot Nuclear Plant of the Same Type—With NRC License

### **2. TRAINING**

Must Complete the Utility's Qualification Program to Include:

- Procedures (Administrative, Normal, Abnormal and Emergency)
- Tech Specs
- Systems
- Examination

Note: Training Will Be Determined by Individual's Previous Experience

### **3. RESPONSIBILITIES/DUTIES**

- Responsibilities at the Senior Operator Level with Commensurate Authority Will Be Assigned by Shift Supervisor
- Responsible to Recommend Appropriate Actions (Including Shutdown) to Shift Supervisor
- This Individual Will Have Direct Access to Management Above the Shift Supervisor to Resolve Any Disagreements that Arise

### **4. DURATION**

- Until Utility Meets Stated Shift Experience Requirements

In closing, let me again state that, in our judgment, our plan will provide a more effective mechanism for assuring a responsible level of shift operating experience than other plans which have been suggested. It provides an effective mechanism for measuring the nuclear plant experience base within each operating crew. It assures that each shift will have commercial plant experience within the SRO positions or within the trained shift advisor. Finally, it will avoid further strains and dislocations within the utilities now operating plants which would almost surely result if the NTOL utilities were now required to recruit experienced operators from others.

All of the utilities represented here appreciate the opportunity to discuss this question with you. We appreciate the input of the staff and are hopeful that our plan will receive your endorsement.

INFORMATION REQUIRED REGARDING SHIFT ADVISORS

1. A resume of each shift advisor which highlights his previous operating experience.
2. A copy of the procedure which describes the duties and authority of the shift advisors and the working relationships between the advisors and the operating shift personnel.
3. A copy of the training program presented to the shift advisors to assure they have adequate knowledge of plant specific matters to properly perform their duties.
4. A copy of the written examination administered to the shift advisors and the results of the examination, if available.
5. A description of, and copies of notes regarding, the oral examination administered to the shift advisors.
6. A description of the training program presented to the operating shift crews to assure that they understand the role of the shift advisors.
7. A statement regarding the medical qualification requirements for the shift advisors.
8. A description of the procedures that will be used to evaluate the performance of the shift advisors during plant start-up.