SURVEY OF OPERTORS, SHIFT SENIOR OPERATORS

AND

SHIFT TECHNICAL ADVISORS

REGARDING

DEGREE REQUIREMENTS FOR SENIOR OPERATORS

PREPARED BY

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INTRODUCTION

On May 30, 1986, the Nuclear Regulatory Commission (NRC) published an Advance Notice of Proposed Rulemaking (ANPRM) in the Federal Register entitled, "Degree Requirements for Senior Operators at Nuclear Power Plants."

Interviews were conducted at six operating nuclear power plants[1] with 18 operators, 18 senior operators and 13 shift technical advisors to determine their beliefs on the need for the requirement and its impact.

Other items were discussed such as regarding the benefit of other NRC initiatives and their perception of training and education requirements.

DISCUSSION

The KMC Qualification of Reactor Operators utility group (QRO) determined that the perspective of those who operate nuclear power plants on the ANPRM should be included as part of the QRO comments. It was determined that it would be better to interview individuals than to send out questionnaires for them to complete. The interviews were conducted at six operating nuclear power plants during the time period August 4 through August 15, 1986. All plants have been operating for at least four years and are located on the east coast, mid-west and west coast. Additionally, the plants included nuclear power supply systems of the four principal vendors, B&W, Westinghouse, GE and C.E. Eighteen operators (RO), 18 senior operators (SRO) and 13 shift technical advisors (STA) were interviewed. Profiles of those interviewed is contained in Table 1 and 2.

(1) Palisades, Crystal River, Turkey Point, San Onofre, Monticello and Prairie Island

The individuals were assured of confidentiality. The results of the interviews were not discussed with plant management.

The overwhelming majority of those interviewed believed that a degree requirement for senior operators is not necessary. Those who voiced this opinion included one RO and three SROs who have B.S. degrees and one SRO who has a M.S. degree.

None of those interviewed questioned the need for high school graduates to receive additional education and training prior to operating a nuclear power plant. However, the majority believed that the present performance based training programs combined with on-the-job training and simulator training was the proper mix to prepare an individual for the senior operator position. There was near universal agreement that operating experience was the principal factor in assuring that senior operators would perform their jobs in a safe and competent manner.

Many of the operators and senior operators indicated that shift work was very demanding and after a period of time wanted to obtain day jobs. They indicated strongly that if they obtained degrees they would seek other employment either within the company or outside. They also stated that they believed it would be most difficult to retain college graduates on shift once they had obtained a senior operator license. Consequently, they believe that there would be excessively high turnover in the senior operator position if a degree is required and that this would adversely effect reactor safety because of the decreased experience in the senior operator position.

RESULTS

The results of the interviews to the specific questions are included in Tables 3 through 9.

TABLE 1

PROFILE OF OPERATORS, SENIOR OPERATORS AND SHIFT TECHNICAL ADVISORS

	Number	Age	Experience at Operating Plants		Years Licensed		Years on Shift
			Civilian	Navy	SO	RO	Includes Navy
Operators	11	31.5 (25-46)	7.6 (4.5-16)	--		3.4	7.2
	7	30.5 (27-35)	4.0 (2-10)	5.7 (4-8)		2.1	8.6
Senior Operators	7	40.0 (30-58)	13.5 (8-25)	--	4.8	3.4	13
	11	35.0 (28-43)	6.8 (2-14)	5.8 (4-9)	4.1	0.6	9.5
Shift Technical Supervisors	6	38 (26-44)	9.1 (4-18)	--	2.6	---	0.8
	7	38 (31-46)	10.3 (3-22)	4.6 (3-8)	5.7	---	4.1

TABLE 2

PROFILE OF OPERATORS, SENIOR OPERATORS AND SHIFT TECHNICAL ADVISORS

	RO		SO		STA	
EDUCATION	NO.	%	NO.	%	NO.	%
High School Only	9	50%	5	28%	---	
Some College	6	33%	7(1)	39%	1(3)	7%
Associate Degree	1	6%	2(2)	11%	---	
B.A.	1	6%	---		---	
B.S.	1	6%	3	17%	9	69%
Some Post Graduate	---		---		2	17%
M.S.	---		1	6%	1	7%

(1) 10 CR HR to 3 years
(2) Business
(3) 3 years college P.E.

TABLE 3

Do you believe all senior operators should be required to have a B.S. degree in engineering or the physical sciences?

	Yes	No	No Opinion
RO	1	17	
SO	0	18	
STA	2	11	
TOTAL	3	46	0

What will be the impacts of this?

	RO	SO	STA
High turnover in the SO position?	15	17	10
Adversely affect operator morale.	8	7	7
Loss of experience in SO position.	7	6	7
Lose valuable supply of experienced personnel.	7	8	8
Improve operations.	--	1	3

TABLE 4

Do you believe senior operators should be required to obtain college credits in technical subjects such as:

	Yes			No		
	RO	SO	STA	RO	SO	STA
Mathematics	5	3	4	13	15	9
Chemistry	6	2	4	12	16	9
Reactor Physics	5	6	5	13	12	8
Hydraulics	6	7	4	12	11	9
Mechanics	6	4	4	12	14	9
Health Physics	4	2	3	14	16	10

Do you believe these subjects are covered to the proper depth in the present training program?

	Yes	No
RO	11	7
SO	13	5
STA	8	5

TABLE 5

Do you believe senior operators should be required to receive technical training in engineering and reactor theory that addresses design basis events and severe accidents?

	Yes	No	No Opinion
RO	10	6	2
SO	15	3	-
STA	12	1	-

Do you believe senior operators should be required to receive college courses in engineering and reactor theory that addresses design bases events and severe accidents?

	Yes	No	No Opinion
RO	1	15	2
SO	7	11	-
STA	3	10	-

TABLE 6

Do you believe that a B.S. degreed SO on shift will enhance safety?

	RO	SO	STA
Considerably	1	1	2
Marginally	2	2	2
Not at all	15	15	9

Do you believe having a degreed SO on shift with only two years of nuclear experience will be detrimental to safety?

	RO	SO	STA
Considerably	11	10	3
Marginally	3	3	5
Not at all	4	3	4
No Opinion	--	2	1

TABLE 7

What training and experience would you require for a recent college graduate before you would assign him to a senior operator position?

Training (1.5 year program)	RO	SO	STA
Full SRO Program	18	16	10
Tailored Program	--	2	3

Experience:	RO	SO	STA
Perform as Aux. Op.	5	--	
Perform as RO	11	13	7
Perform as Second SO	3	7	7
Tailored	2	--	1

Total number of years of Training and Experience	Less than 2 years	2 years	3 years	4 years	More than 4 years
RO	---	3	7	5	2
SO	1	3	5	8	1
STA	1	4	3	5	---

TABLE 8

How would this requirement effect you?

	RO	SO [1]
Obtain a degree	10	9
Remain in present position	1 [2]	5
Change career path	4	1 [3]
Obtain SO License Before 1991	2	--

(1) Three SOs have B.S.: one a B.A. and one a M.S.
(2) RO with B.S. now on days - will not return to shift.
(3) SO with B.S. degree.

If you obtained a degree would you continue as SO on shift?

	Yes	No
RO	8	2
SO	5	4

How long would you remain on shift?

	One Year	Two Years	Longer	Career
RO	2	1	1	4
SO			3 [1]	2

(1) Until company was compensated; 3 to 6 years.

TABLE 9

Have the following NRC sponsored initiatives been effective in improving safety and have enhanced coping with abnormal and emergency situations:

	Considerably	Marginal	None	Decreased	No Opinion
Safety Parameter Display Panel					
RO	9	3	1	---	5
SO	10	5	2	---	1
STA	9	1	1	---	2
New Emergency Procedures					
RO	9	3	2	1	3
SO	9	2	3	2	2
STA	7	3	---	1	2
STA					
RO	6	6	4	---	2
SO	12	3	2	---	1
STA	7	5	1	---	---
Combined SO/STA					
RO	5	1	1	3	8
SO	4	1	4	3	6
STA	3	---	3	5	2

	Considerably	Marginal	None	Decreased	No Opinion
Reactor vessel level instrumentation system					
RO	5	1	1	---	11
SO	2	3	2	4	7
STA	4	---	3	---	6
Increased emphasis on training					
RO	15	3	---	---	---
SO	12	5	1	---	---
STA	8	3	---	1	1
Plant specific simulator					
RO	16	2	---	---	---
SO	17	1	---	---	---
STA	12	---	---	---	1