



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

NOV 7 1986

MEMORANDUM FOR: William T. Russell, Director ✓
Division of Human Factors Technology

Julius J. Persensky, Section Leader
Personnel Training Section
Maintenance and Training Branch
Division of Human Factors Technology

FROM: Frank H. Rowsome, Chief
Human Factors Issues Branch
Division of Human Factors Technology

SUBJECT: OBSERVATIONS ON THE INPO TRAINING ACCREDITATION BOARD
MEETING OF JULY 23 AND 24, 1986

I attended the INPO Training Accreditation Board meetings on July 23 and 24, 1986, as the NRC observer. The training programs under review for accreditation were for the non-licensed operator (NLO), RO, and SRO positions for Duane Arnold (Iowa Electric Light and Power), Crystal River Unit 3 (Florida Power Corporation), and St. Lucie Units 1 and 2 (Florida Power and Light).

The Accreditation Board was composed of Forrest Remick (Chairman), John Griffin, Ed Jones, William Kimel, and Don Schnell (absent for St. Lucie). In addition to the INPO team leader who presented the results of the staff evaluation, INPO attendees included Ken Strahm and Walt Coakley. Additional INPO staff members were non-participant observers: Wayne Hollinger, Phil McCullough, Ron Ceravolo, and Walter Popp.

In each case, the INPO team leader gave an introduction to the Board before the utility representatives were invited in. This entailed background information on the plant, the utility organization, the history of the training upgrade effort at the facility, and the experiences of the INPO team in their assistance/evaluation trips to the facility. The Board directed a number of questions to the INPO team leader on these subjects.

Next, the utility representatives were invited to join the meeting. These included one or two vice presidents, a senior manager from plant operations, the manager in charge of training, and the training specialist. Following the introductions, the INPO team leader went through the summary report section by section. These were organized along the lines of the criteria in "The Accreditation of Training in the Nuclear Power Industry," September 1985, criteria, INPO 85-002, Revision 1. In each case, all the Board members participated in asking questions; some were fielded by the INPO team leader, some by the utility representatives, and occasionally by Ken Strahm or Walt Coakley.

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Enclosed are the agenda, notes on each case, the organization chart for each utility, and INPO hand-outs on: "Assist Visit (mini-evaluation) Criteria," and "SER [Self Evaluation Report] Review Tracking."

My general observations follow:

1. All three utilities have clearly committed the resources and made the organization changes necessary to develop an excellent training program. All have staffed up, all have invested in upgrading the curriculum and established diverse and redundant feedback loops to verify that the training is effective, all are building greatly enlarged training facilities, and have plant-referenced simulators on order.
2. In each case, the Self Evaluation Report prepared by the utility against INPO criteria were of material value to the utility in identifying deficiencies. This was particularly true of the two utilities that submitted after the Revision 1 INPO guide was available, and less true of FPC whose filing preceded the detailed INPO criteria.
3. In each case, the INPO assistance/evaluation teams were thorough in their search for additional deficiencies, had been of material value to the utility in upgrading the training program, and were thoroughly familiar with the current status of the training program.
4. Forrest Remick twice expressed the concern that the INPO writeup on each licensee's training evaluation was hard for the Board to use to make up its own mind, although it is an effective summary of the INPO staff review. I, too, had the same feeling in reading the reports the night before. Impressionistic evaluation is lacking.
5. In each case, all the Board members were active in asking questions and had clearly read the material. They seemed highly conscientious and serious about their accreditation function. They displayed a high level of respect for the INPO staff evaluations, but I felt this was deserved and appropriate.
6. The process seems to be a thorough check on whether the institutional, administrative, and procedural machinery is in place for a sound training program. I think it highly unlikely that a training program with significant deficiencies would be accredited. In one case, FPC, the training program required four assistance/evaluation trips by the INPO staff team, and the upgrading to INPO standards had apparently been a long and painful process on both sides. Nevertheless, both the INPO staff documentation and the Board meeting convinced me that FPC now has a sound training program and that the few residual areas for improvement identified and plans and resources in place to finish the job.

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7. Checks and balances to assure that the training content is appropriate and that the training is effectively received a great deal of attention - for routinely used job knowledge and abilities - by both the INPO team and the Board. However, the training depends upon plant procedures to identify rarely used skills and abilities. This is a serious weak spot in the program. It is not only possible but quite likely that knowledge, skills, and abilities that are needed only in multiple failure or severe accident contexts will not be picked up in the training objectives.
8. INPO and the Board did pay some attention to experience feedback: assuring that lessons of operating experiences are fed back into training objectives. However, I am not convinced that this was probed deeply enough to assure that it, too, is not a weak spot.

Following the third and last Board meeting, the Board solicited my comments. I summarized the points above and added several more. My experience with availability engineering, risk analysis, and cost/benefit analysis lead me to doubt that these training upgrades will prove to be cost effective, particularly in light of the costly new training facilities and simulators.* It appears that they are gold-plating all aspects of training without discriminating which elements of the skills and abilities warrant focused attention. I believe it is well within the state of the art to use PRA, systems engineering, availability engineering, and human factors engineering to make a discrimination of those aspects of job knowledge warranting focused attention. The result could cost less and give much better assurance that the severe accident and experience feedback weak spots do not harbor serious deficiencies in training.

Ken Strahm jumped in to defend the program. He reported that they had started down the path I was suggesting, but had concluded that: (a) the necessary training infrastructure was not there and needed to be developed, and (b) that discriminating what is really worth thorough training proved to be too difficult. He acknowledged the weak spot in depending upon procedures to identify training objectives for rarely used skills, and indicated that once the accreditation program is complete, i.e., the training infrastructure in place, they (INPO) mean to tackle the problem of upgrading procedures and the skills and abilities catalogs.

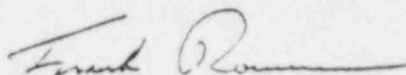
In order to fill the weak spot associated with learning objectives for multiple failure and severe accident scenarios, I suggest two sources of

* The Board had asked the ranking vice presidents of two of the candidate utilities whether they felt that the training upgrade would be cost effective. Both said yes.

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perspective on the necessary training content be employed. First, for generic perspectives, the risk-dominant accident sequences from PRAs and precursor studies should be employed. For a plant-specific refinement, I suggest the Individual Plant Evaluations (under discussion between IDCOR and the NRC as partial fulfillment of the Severe Accident Policy) be employed. With these generic (and plant-specific) catalogs of risk dominant accident sequences in hand, a multi-disciplinary team composed of: (1) experts on the systems end of PRAs, (2) operations and systems experts, and (3) human factors experts can translate the classes of important accident scenarios into critical areas for the refinement and extension of both emergency operating procedures, knowledge and abilities catalogs, and learning objectives.

I suggest that this be done twice - once generically, perhaps by vendor owners groups - and once again with plant-specific material based on the IPEs. The results would be of immense value at many levels, ranging from new insights into shift staffing and the strengths and weaknesses of MMI, etc. to the other extreme: cataloging the scenarios and circumstances in which the pattern of symptoms may appear to warrant an operator action that would really be counter-productive. If we can make substantial progress in nailing down these highly risky scenarios, then we can - at long last - truly have a basis to identify what needs focused attention in emergency operating procedures and training.



Frank H. Rowsome, Chief
Human Factors Issues Branch
Division of Human Factors Technology

Enclosures:

1. Agenda
2. Board Notes (3)
3. Organization Chart (3)
4. "Assist Visit Criteria"
5. "SER Review Tracking"

NATIONAL NUCLEAR ACCREDITING BOARD

July 23, 1986

Iowa/D Arnold

8:00 a.m.	Coffee, juice, and doughnuts INPO Board Room (1505)	
8:15 a.m.	Opening remarks by the chairman pro tem	Forrest Remick
8:30 a.m.	Staff discussion	Ron Fritchley
8:45 a.m.	Board review of Duane Arnold Energy Center's training programs:	Forrest Remick
	NLO - non-licensed operator	
	RO - reactor operator	
	SO - senior reactor operator/shift supervisor	
	STA - shift technical advisor	
	o INPO Team Manager presentation	Ron Fritchley
	o Iowa Electric Light and Power Company's presentation	
	- Richard McGaughey, Manager, Nuclear Generation Division	
	- Dan Mineck, Plant Superintendent - Nuclear	
	- Gary VanMiddlesworth, Training Superintendent	
	- Bob Tucker, Staff Instructional Technologist	
10:45 a.m.	Board deliberations	
11:30 a.m.	Lunch and Accrediting Board Business	
12:30 a.m.	Staff Discussion	Ashley Erwin
12:45 a.m.	Board review of Crystal River Unit 3's training programs:	Forrest Remick
	- non-licensed operator	
	- licensed operator	
	- licensed operator requalification	
	o INPO Team Manager presentation	Ashley Erwin
	o Florida Power Corporation's presentation	
	- Wally Wilgus, Vice President, Nuclear Operations	
	- Paul McKee, Nuclear Plant Manager	
	- Larry Kelly, Nuclear Operations Training Manager	
	- Steve Blake, Nuclear Non-licensed Operator Training Supervisor	
	- Dave Watson, Nuclear Operations Training Academic Specialist	
2:45 p.m.	Board deliberations	
3:30 p.m.	Information update	
4:15 p.m.	Adjournment/Van leaves for Waverly Hotel	
6:00 p.m.	Meet in the Waverly Hotel lobby to go to a local restaurant for dinner	

FPC/CR-3

FP&L

NATIONAL NUCLEAR ACCREDITING BOARD

July 24, 1986

8:00 a.m.	Coffee, juice, and doughnuts INPO Board Room (1505)	
8:15 a.m.	Opening remarks by the chairman pro tem	Forrest Remick
8:30 a.m.	Staff discussion	Ashley Erwin
8:45 a.m.	Board review of Saint Lucie Nuclear Power Plant's training programs:	Forrest Remick
	<ul style="list-style-type: none">- non-licensed operator- reactor operator- senior reactor operator/shift supervisor- radiological protection technician	
	<ul style="list-style-type: none">o INPO Team Manager presentation	Ashley Erwin
	<ul style="list-style-type: none">o Florida Power & Light Company's presentation<ul style="list-style-type: none">- Joe Dickey, Vice President, Nuclear Operations- Bill Waylett, Manager, Nuclear Training- Ken Harris, Site Vice President, St. Lucie- John Barrow, Operations Superintendent- Pat Fincher, Training Superintendent	
10:45 a.m.	Board deliberations	
11:30 a.m.	Lunch	
12:15 p.m.	Van leaves for Atlanta Airport	

NOTES ON THE
INPO ACCREDITATION BOARD REVIEW
FOR
DUANE ARNOLD, IOWA ELECTRIC

Note that these items are merely highlights of particularly interesting questions. They represent a small percentage of the board discussions.

INPO staff spokesman: Ron Fritchley

- Iowa Electric is building a new training facility and has ordered or is evaluating bids with the intent to order a plant-specific simulator.
- McGaughy [pronounced Ma-Gaw-hee] is the equivalent of the VP-Nuclear at most utilities: the ranking manager with all-nuclear responsibilities.
- Board question on selection testing - A: Very little.
- Iowa's "Training System Development Manual" is exceptionally good and very plant-specific.

Iowa personnel invited in:

- Roughly 20 people/year enter the NOL-RO-SRO up and out pipeline.
- Iowa has not had difficulty finding applicants to meet their requirement for one college year of physics, chemistry and calculus. Most have two to three years of college.
- Iowa doesn't use selection tests; they considered it but couldn't validate them.
- Iowa asserts 90+ percent pass rate on NRC licensing exams.
- Never had to fire anyone but they have the capability in the contract. Drop-outs absorbed in the company elsewhere.
- BQ: Effect of fitness-for-duty on selection? A: No problem thus far.
- Self-study packages include programmed learning manuals.
- BQ: Team or individual training? A: Both - everyone trained individually but simulator time is as a team.
- BQ: Off-shift requal? A: One shift per month to keep current for operators not on shift.

- 50 percent of on-shift SROs have degrees.
- BQ: Feedback from plant operators and experience? A: Operators and instructors have good rapport; lots of cross-talk.
- Iow has Corporate Goals, e.g., minimize cost to the consumer, minimize the need for new production facilities, and Nuclear Goals, e.g., reduce dependence on contractor personnel, get INPO accreditation, etc.
- No questions on job task analysis.
- Diagnostic and team training used to be done after simulator training, now done before.
- None of the Iowa representatives could come up with good examples of the feedback into training of NRC requirements or operating experiences at other plants.
- Upgrading learning objectives, content outlines, and instructor guidelines for simulator training.
- Upgrading remedial training.
- Tech Specs preclude things like hands-on practice on resetting overspeed trips of turbine-driven pumps for training.

Overall impression: Both Iowa and INPO think that their training program was unusually good to begin with, and the upgrading for INPO accreditation particularly easy, due - in large part - to an Iowa commitment to excellence in training from the outset.

NOTES ON THE
INPO ACCREDITATION BOARD REVIEW
FOR
CRYSTAL RIVER 3, FLORIDA POWER CORPORATION

Note that these items are merely highlights of particularly interesting questions. They represent a small percentage of the Board discussions.

INPO team leader: Ashley Erwin

- SER May 1984; first visit April 1985.
- Erwin has been working on CR-3 for some time.
- INPO site evaluation found records too poor to evaluate.
- NRC found problems with document audits; 70 percent failure rate for requal exams in 1984 or 1985.
- Training manager and deputy replaced in early 1985 by FPC; Kelly and Blake are new.
- Plant evaluation in the spring: Favorably impressed with operations. Ken, Walt, and Ashley all report major improvement, lots of effort, and full commitment from Wilgus.
- Massive FPC effort to upgrade records and procedures. Authorization to hire fine new instructors (10-15) just issued.
- Commitment to a plant-specific simulator.
- Old (1984) Self Evaluation Report is out-of-date, prepared before INPO criteria. SER would not be acceptable today but INPO does not require rework of SER.

FPC personnel invited in: Wally Wilgus, Vice President Nuclear Operations; Paul McKee, Plant Manager; Larry Kelly, Training Manager of Nuclear Operations; Steve Blake, Training Supervisor for NLOs (acting for LOs as well); Dave Watson, Nuclear Operations Training Academic Specialist.

- OIA investigation on lack of backup for training claims for RO/SRO candidates discussed.
- FPC attributes high requal failure rate in 1984-1985 to preparation for essay questions: all who failed did so on written, not walk-through, predominantly those whose training was pre 1979. Not prepared for

multiple choice exams. Trainers did much better on exam. Since then, FPC has had all their ROs and SOs who hadn't just been licensed or passed a requal exam take an NRC requal exam.

- ° Three assistance/evaluation team visits to FPC since original April 1985 visit; most recent June 1986.
- ° CR-3 has a "check operator" who gives walk-through exams, requals. He also provides feedback to training on what is changing in the plant and feedback on training effectiveness.
- ° McKee has a good story on procedures. Based on ATCG plus observations of operators on the simulator. Claims they are well-human-factored; proud of them.
- ° McKee is also proud of their SPDS. Claims its a good one. They had it in 1980 and used it during their NNI bus fault event in the spring of 1980. They use it in all modes of operation including startup and shutdown.
- ° STAs filter operating events at other plants, etc., to determine which should go into training.

General impression: FPC really does seem to be trying hard to establish excellence.

NOTES ON THE
INPO ACCREDITATION BOARD REVIEW
FOR
ST. LUCIE, FLORIDA POWER AND LIGHT

Note that these items are merely highlights of particularly interesting questions. They represent a small percentage of the Board discussions.

INPO team leader: Ashley Erwin.

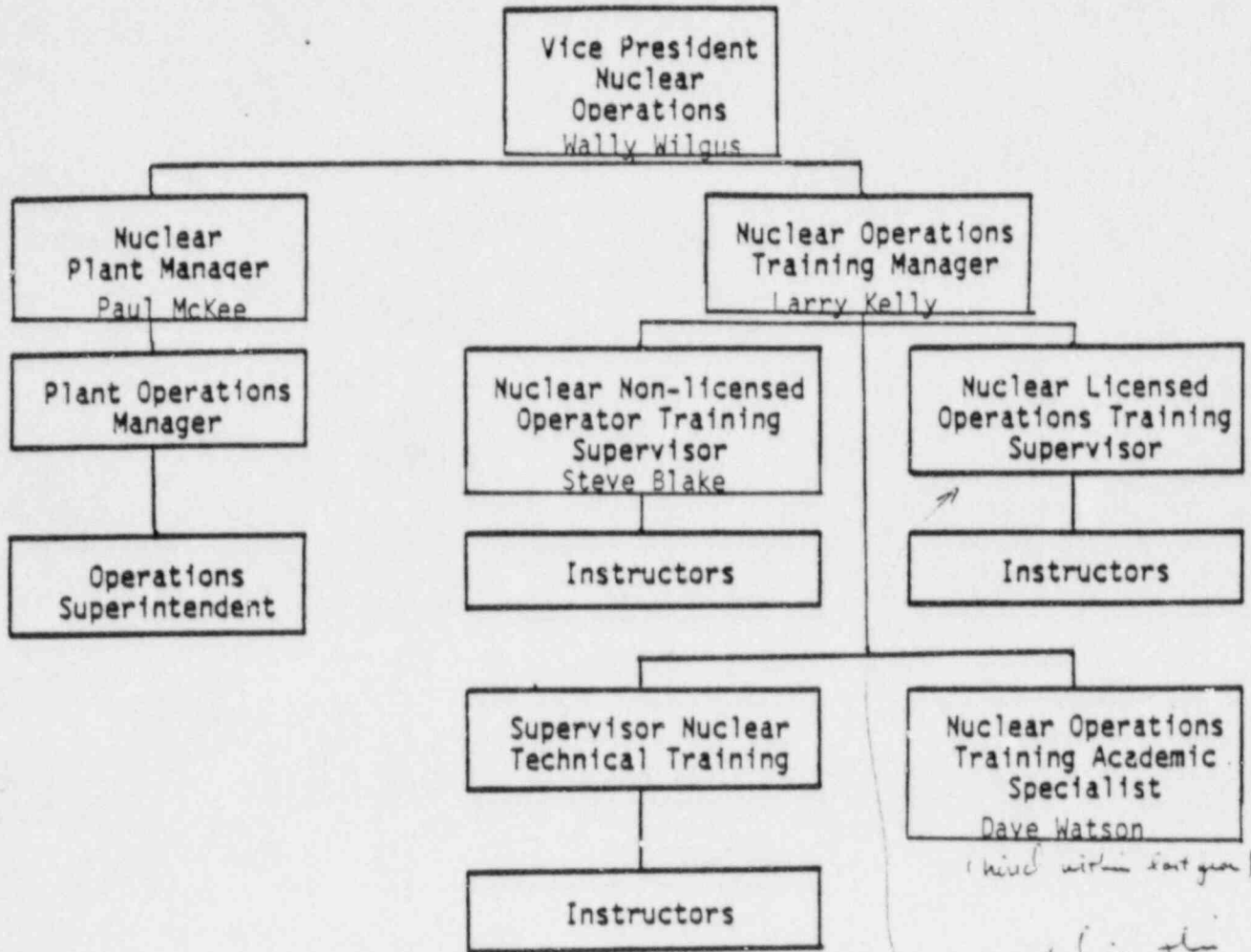
- March 1986 team visit.
- New training building and simulator under construction.

FP&L invited in: Joe Dickey, Bill Waylett, Ken Harris, Pat Fincher, and John Barrow.

- Continuing training: rarely practiced emergencies, plant changes - upgraded.
- FP&L employs Systems Approach to Training: redundant feedback loops on training content and effectiveness.
- Board questions on requal and continuing training, SAT feedback loops, certification, continuing training for instructors. Good FP&L answers.
- INPO team worked with FP&L to upgrade OJT, training objectives, training effectiveness feedback, operating experience feedback into training, etc.
- Remick Q: Containment venting for core melt? Fincher A: EOPs cover hydrogen purge - claims it is applicable. Such EOPs covered in both initial and continuing training for SROs.
- Continuing training includes backfitting of upgrades to initial training.
- FP&L says they used one of our NUREG/CR reports to transplant airlines know-how about "team involvement," continuing training, and simulator training.
- FP&L volunteered that they use INPO NPRDS data to construct scenarios for training exercises,atta boy from Board.
- FP&L's goal is to have the best-managed nuclear program in the industry.

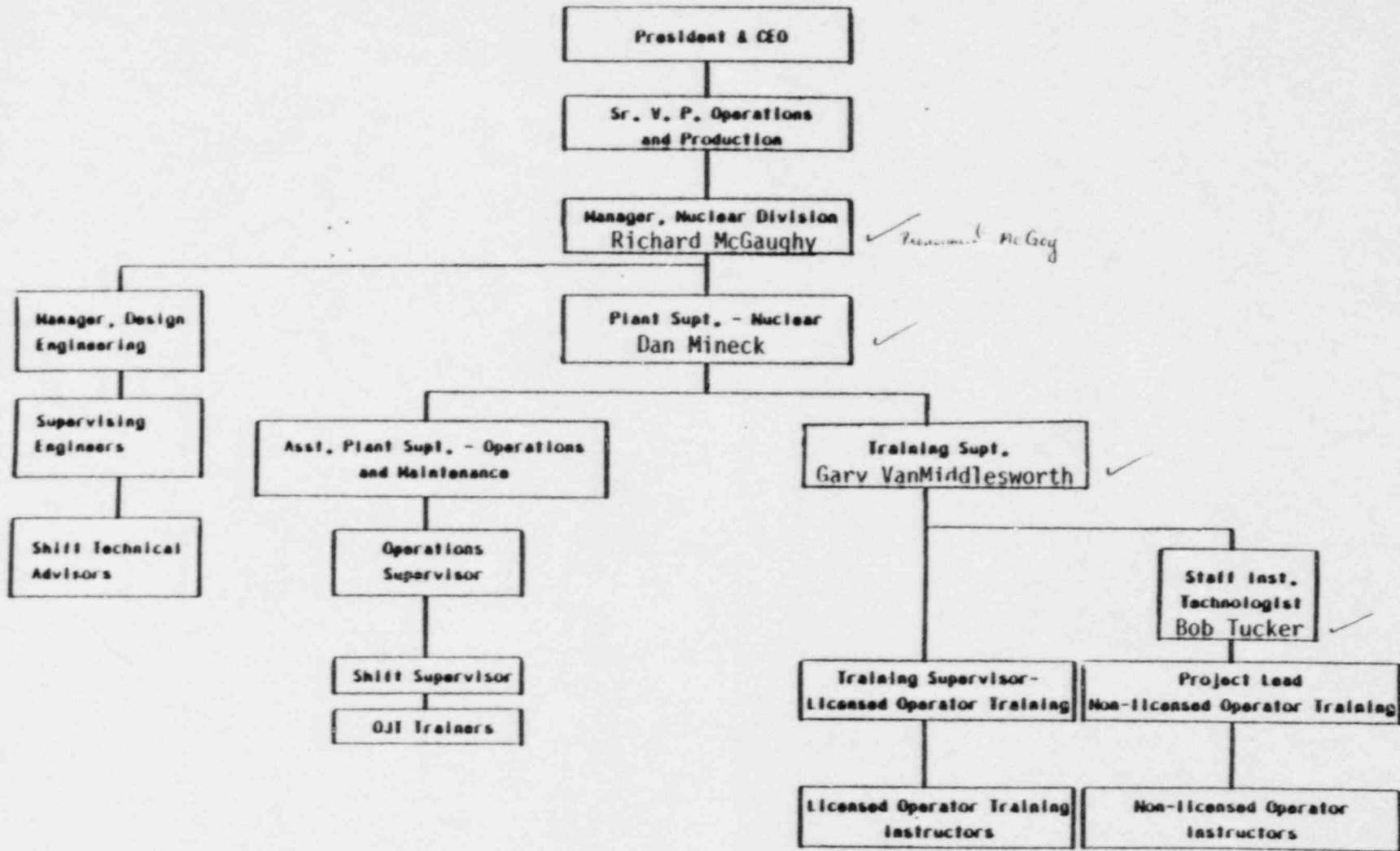
Overall impression: FP&L is confident, proud, but still occupied with selling their excellence. No one turned up evidence that they have missed something. They appear to be in better shape than FPC, but not so good as Iowa.

CRYSTAL RIVER ORGANIZATIONAL CHART

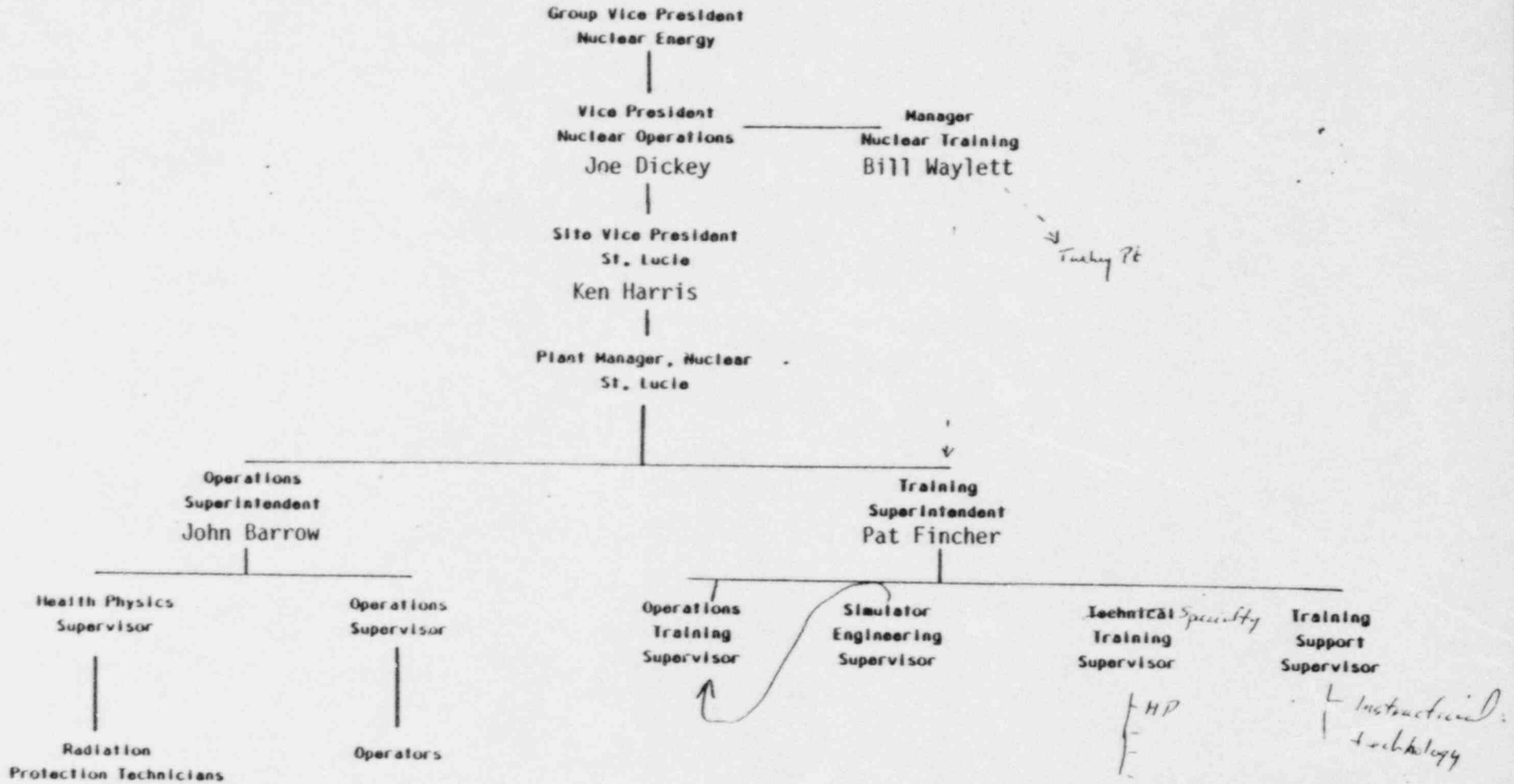


Blake acts in the position most of this year as well as running N2O.

DUANE ARNOLD ORGANIZATIONAL CHART



ST. LUCIE ORGANIZATIONAL CHART

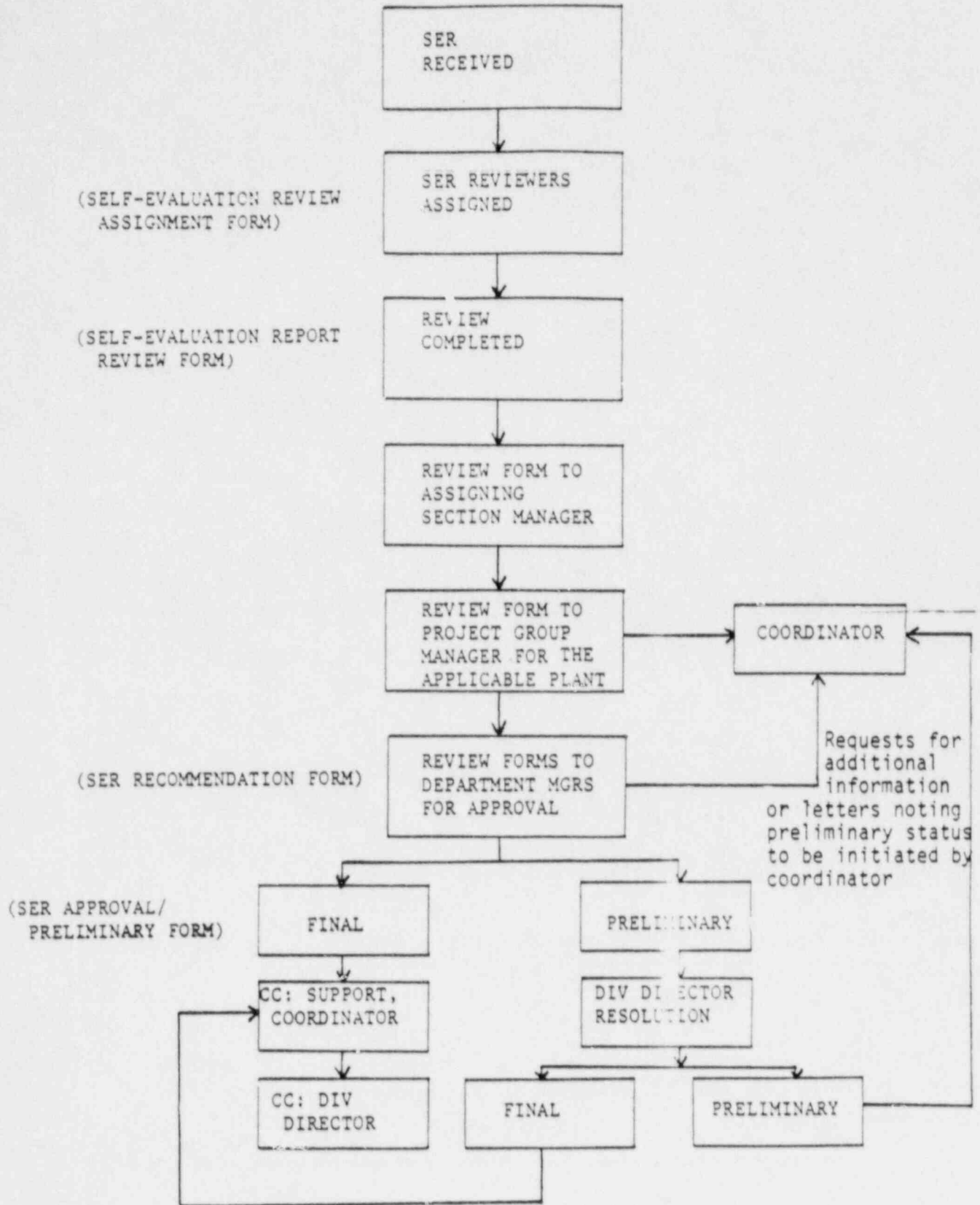


Assist Visit (mini-evaluation) Criteria

1. Has the utility developed a list of tasks selected for training based on a thorough job analysis?
2. For existing programs, has the utility compared its existing materials to the tasks selected for training?
3. Has task analysis been performed on those tasks where existing materials did not provide adequate training of the task? How much to do? Done when?
4. Have learning objectives at least one level of detail below the task statement been designed for the complete program?
5. Has the utility completed the upgrade of its existing training materials based on the comparison done in 2 above? If not, when is this scheduled for completion? How much work remains to be done?
6. For programs with new materials, has the utility established a development plan to complete materials prior to the next scheduled implementation using these materials? What is the target date for completion? How much work remains to be done?
7. If mostly new programs, has some part of each program been taught in each training setting (classroom OJT, etc.)? How much? When will the new materials be implemented?
8. Has the utility developed and fully implemented its training system procedures? How much?
9. Has the utility used its feedback mechanisms to evaluate program effectiveness and make improvements where needed? How much?
10. Have all weaknesses or major deficiencies identified during the self-evaluation been corrected or have adequate action plans been established to correct these deficiencies in a timely manner? What are they?
11. Are there major activities to be performed not listed above?

SER REVIEW TRACKING

ENCLOSURE 5



SELF-EVALUATION REVIEW ASSIGNMENT

To: _____

You have been assigned to review the following self-evaluation report:

Plant/Utility _____

Programs N R S A I E M C H T

Type Review: Systems Programs

Coordinator _____

Other Reviewers _____

- (1) Obtain a copy of the SER from the appropriate shelf.
- (2) Complete the attached SER Review form.
- (3) Forward the SER Review form to your section manager.
- (4) If the assignment cannot be completed by the expected date, please contact your section manager.

Date assigned _____ Expected completion date _____

Date completed _____

Systems
or
Programs

SELF-EVALUATION REPORT REVIEW SUMMARY
(Form also to be used to review additional requested information)

Review the self-evaluation report using the applicable Accreditation Objectives and Criteria (INPO 85-002, Rev. 1). Provide weaknesses and information needs as appropriate below with any additional comments attached. Complete SER Review Worksheet and attach to this sheet.

Recommendation:

- Reject as preliminary
- Schedule assist visit
- Schedule team visit

Comments:

Review completed:

Date

Reviewer

Date

Section Manager

Following Section Manager concurrence, forward forms to Project Group Leader.

PLANT _____

SER REVIEW WORKSHEET

DATE _____

Systems

PROGRAMS _____

REVIEWER _____

or Programs

PROGRAMS (N, R, S, A, I, E, M, C, H, T)

1. Has the utility developed a list of tasks selected for training based on a thorough job analysis?
2. For existing programs, has the utility compared its existing materials to the tasks selected for training and included a matrix in the SER?
 1. A. Has task analysis been performed on those tasks where existing materials did not provide adequate training of the task?
 - B. For new programs, has the utility designed L.O.s, T.O.s, JPMs, etc. to show how new materials were developed based on the tasks selected for training?
4. Has the utility completed the upgrade of its existing training materials based on the comparison done in 2 above?
 1. Lesson Plans
 2. OJT materials
 3. Lab Guides
 4. Simulator Guides
 5. Other materials
5. For programs under revision, has the utility established a development plan to complete materials prior to the next scheduled program using these materials?
6. Has the utility developed and fully implemented its training system procedures?
7. Has the utility established and implemented feedback mechanisms to evaluate program effectiveness and make improvements where needed?
8. Have all weaknesses or major deficiencies identified during the self-evaluation been corrected or have adequate action plans been established to correct these deficiencies in a timely manner?

	N	R	S	A	I	E	M	C	H	T

Based on your review of this final SER, do you that this utility is prepared to receive an Accreditation Team Visit?

Comments on back

SER RECOMMENDATION

TO: _____, Department Manager

FROM: _____, Project Group Leader

Plant _____

Coordinator _____

Programs N R S A I E M C H T

Reviewers:

Programs _____

Systems _____

The following recommendation has been made by the Training Programs and Training Systems reviewers concerning the above mentioned SER(s).

Reject as Preliminary

Schedule Assist Visit

Schedule Team Visit

Comments/Weaknesses:

Attachments:

Training Programs Review Summary
Training Systems Review Summary

SER APPROVAL

Comments:

Approval:

Training Programs Department Manager

Training Systems Department Manager

PRELIMINARY SER

Actions Required:

Concurrence:

Training Programs Department Manager

Training Systems Department Manager

Accreditation Division Director

After signatures, forward to Accreditation Support Section with a copy to the
plant coordinator for follow-up action.