

DCD

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Docket No. 50-266  
Docket No. 50-301

Wisconsin Electric Power Company  
ATTN: Mr. Abdoo  
231 West Michigan Street - P379  
Milwaukee, WI 53201

Mr. Abdoo:

Based on a recent request by Mr. C. W. Fay, we are providing you with information that may be of benefit in improving your ALARA program at the Point Beach Nuclear Plant. Enclosed are two reports that provide the results of special ALARA team inspections we conducted at the LaSalle County Nuclear Generating Station in April 1990, and the Palisades Nuclear Power Plant in May 1990. Also enclosed is a copy of the procedures the assessment team used to conduct the Palisades inspection. Please keep in mind that these procedures were developed specifically for these two assessments, and are subject to modification based on experience gained during their usage.

If you have any questions on the results of either inspection or the procedures, please contact Mr. William Snell of my staff at (708) 790-5513.

*Carl Payerella*  
A. B. Davis  
Regional Administrator

Attachments: As stated

cc w/attachments:  
DCD/DCB (RIDS)  
Resident Inspector (RIII)

*IErb*

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PDR ADOCK 05000266  
Q PDR

*yes w/o reports*  
RIII  
*WBS*  
Snell/jp  
12/5/90

RIII  
*Gregger*

RIII  
*WBS*  
Norelius  
12/6/90  
RIII  
*Yes*  
CJP  
*CP*

RIII  
*CP*  
Davis  
12/7/90

## ALARA TEAM INSPECTION GUIDANCE

### 1. Background

- 1.1 Review dose history, including significant high dose jobs.
- 1.2 Review ALARA program history.
- 1.3 Compare exposure for major jobs with the national average.

### 2. ALARA Program/Organization

- 2.1 Verify that an adequate written management policy, statement has been issued to cover the ALARA program.
- 2.2 Through interviews and inspector assessment, determine management and worker participation and knowledge of the ALARA program.
- 2.3 Is management committed towards ALARA as demonstrated by its allocation of manpower and resources, along with verbal and written endorsements to this commitment?
- 2.4 Is there an ALARA suggestion/incentive program? If yes, is it effectively used?
- 2.5. Is ALARA considered in employee/management performance appraisals?
- 2.6 Determine whether the following positions exist, and whether the assigned personnel are qualified for the positions:
  - 2.6.1 Full time ALARA Coordinator.
  - 2.6.2 ALARA Committee.
- 2.7 Verify that responsibilities for conducting the ALARA program have been assigned to the following positions:
  - 2.7.1 Corporate ALARA organization.
  - 2.7.2 Plant Manager.
  - 2.7.3 ALARA Coordinator.
  - 2.7.4 ALARA Committee.
  - 2.7.5 Radiation Protection Manager
  - 2.7.6 Health Physics Department.
  - 2.7.7 Design Engineering.
  - 2.7.8 Outage Coordinator.
  - 2.7.9 Individual workers.
  - 2.7.10 Maintenance Department.

### 3. Corporate Involvement

- 3.1 Is Corporate support for ALARA aggressive and effective?
- 3.2 To what degree and under whose direction does the licensee integrate Corporate initiatives into the plant's ALARA program?

- 3.3. What is the plant's assessment of the Corporate ALARA group?
- 3.4 What is the Corporate's assessment of the plant ALARA group?
- 3.5 Does the utility participate in industry study groups for source term reduction techniques?
- 3.6 Has corporate established a system for identifying, evaluating and prioritizing dose reduction items?
- 3.7 What is Corporates role in establishing station dose goals (currently and historically)? If their role has changed, what was the basis for the change?
- 3.8 Does a long range plant exist for budgeting major items?

#### 4. Training

- 4.1 Verify that adequate ALARA training is provided for:
  - 4.1.1 General Employee Training.
  - 4.1.2 Radiation workers.
  - 4.1.3 Radiation Protection Technicians.
  - 4.1.4 Corporate personnel.
  - 4.1.5 Special maintenance teams.
  - 4.1.6 Mockup training and facilities.
- 4.2 Does the ALARA Coordinator participate in professional development activities, such as Westinghouse's REM Seminar or EPRI workshops?
- 4.3 Determine quality of ALARA training program: instructors, facilities, materials.
- 4.4 Assesses the interface between operations, maintenance, radiation protection and training.
  - 4.4.1 Is operations staff trained in ALARA to become sensitive to the needs of maintenance and health physics?
  - 4.4.2 Does operations, maintenance and radiation protection provide feedback to training department on what is/is not working?
- 4.5 Determine if RWP training addresses ALARA.

#### 5. Management Goals

- F.1 Review the licensee's management goals (past and present). How are these goals established?
- 5.2 Does the ALARA program include man-rem goals and objectives for annual totals of individuals and maintenance jobs?

- 5.3 Are there department man-rem goals established and periodically reviewed?
- 5.4 Does the licensee's ALARA program achieve it's goals and objectives?

6. ALARA/RWP Procedure Implementation

- 6.1 Assess mechanics of ALARA reviews: pre and post job review criteria, enforcement of ALARA controls and RWP requirements; input from job supervisor; method by which ALARA controls and RWP requirements are relayed to workers; how actual dose for job is tracked, team size determination.
- 6.2 Are ALARA Coordinators in the field? Are RWPs reviewed? Check the method for estimating the number of man-hours per job. What are the trigger levels for ALARA review and are they effective?
- 6.3 How are plant procedures reviewed? Is ALARA adequately integrated into the procedures and the review process?

7. Planning/Scheduling

- 7.1 Do departments have ALARA coordinators/representatives, or work planning organization with ALARA involvement? What are their functions?
- 7.2 Review the ALARA Committee: function and charter, attendance records, organizational structure (how many?, who's in charge), meeting frequency, final product of meetings, accomplishments, meeting minutes
- 7.3 Verify that the ALARA organization is allowed sufficient lead time to review proposed design changes, modifications, and maintenance work.
- 7.4 Verify that an ALARA package is initiated and processed for individual jobs.
- 7.5 Verify that an ALARA checklist/evaluation with job specific ALARA recommendations, as appropriate, is part of each ALARA package.
- 7.6 Does the ALARA program provide for the continual dose tracking of ongoing jobs to identify whether ALARA projections may be exceeded? Is there a provision to update or modify dose projections as the work progresses?
- 7.7 Verify that the ALARA program has adequate programs for modifying or terminating jobs that deviate from the original objectives.
- 7.8 How are tools staged, shielding installed, and decon performed?
- 7.9 Are mockup training or videotapes provided for high dose jobs that are unique, repetitive or time consuming?

- 7.10 Does ALARA job planning include equipment setup time?
- 7.11 Do planners walk down jobs? What is their input to ALARA reviews (scaffolding, lighting, scheduling, tools, etc.)?
- 7.12 Are job history files maintained and used?
- 7.13 Is a video-library or photo-library of plant areas, components, and equipment setup used for pre-job briefings?
- 7.14 Is a minimum man-rem limit established for requiring a formal ALARA review? (See Section 6.2)
- 7.15 Verify that adequate action levels have been established for each job such as: less than 1 man-rem only requires RWP; greater than 5 man-rem to less than 20 man-rem requires ALARA Coordinator approval; and greater than 20 man-rem requires ALARA Committee approval. Other triggers could be: work in high rad areas greater than 5 minutes; work in 5 MPC; work in highly smearable area (1 Rad/100 cm<sup>2</sup>).
- 7.16 What is the content/protocol for pre-job meetings?
- 7.16.1 Are they initiated on a minimum dose man-rem estimate?
- 7.16.2 Do meetings include all jobs assigned workers and coverage technicians?
- 7.16.3 Are records kept of meetings
- 7.16.4 Are lessons learned from previous meetings discussed?
- 7.17 Does the licensee use designated and experienced crews for decon, installation and removal of scaffolding, tents, temporary shielding, and portable HEPA units; and other high dose jobs such as ISI, steam generator work (jumping, sludge lancing, bolt or stud hole repair, CRD in-vessel, SRM/IRM/LPRM/TIPs) and diving.
- 7.18 Determine whether the ALARA program provides for discussions of work conditions and ALARA experience with other utilities that have participated in similar outages/maintenance. If so, at what level are the issues discussed?
- 7.19 Are excessive numbers of unplanned work items added to the schedule that don't allow for adequate planning?
8. ALARA Initiatives/Operational Practices
- 8.1 Are industry identified methods of reducing source term and innovative methods and techniques planned/implemented?  
Have the Environmental T/S's addressed these methods/techniques?

- 8.2 Determine whether a routine (e.g., weekly) program exists to physically inspect high radiation and very high radiation areas to verify proper controls.
- 8.3 Is preventative maintenance being formed, and if so, is the frequency of the maintenance adequate? Are they being performed at the most dose effective time?
- 8.4 Does the licensee have a leak reduction program?
- 8.5 Is the licensee replacing high cobalt components such as: feedwater regulator valves (BWR's), CVC: flow controllers (PWR's) components of other valves and pumps, control blades, fuel channels, incore instruments, CRDM bearings (BWR's), and steam generator tubes and fuel grids (PWR's)?
- 8.6 Does the licensee use strippable coatings, steam cleaners, hydrolazing grit blasting, dry ice blastings, rotating hones (brushes with nylon bristles tripped with silicon carbide), rotating steel brushes and cylindrical core devices (pigs) with silicon carbide or wire bristles, and floor scabblers?
- 8.7 Are video cameras and communications equipment used for job coverage and/or surveillances in high radiation or high contamination areas?
- 8.8. Are robotics and remote tools used for high dose surveillance, survey, decon, cleaning, cutting, transporting, and manipulating jobs? For example, are robots used for eddy current testing and sludge lancing in steam generators, diving, and ISI (PWR's)?
- 8.9 Is a high-powered pump used for sump cleaning?
- 8.10 Are automatic, multi-stud tensioners and cleaners used for the reactor head and manways?
- 8.11 Are steam generator manway shield plugs/manway doors used (PWR's)?
- 8.12 Are automatic manway removers, such as hydraulic lift tables used (PWR's)?
- 8.13 Are control rod drive handling machines used?
- 8.14 Are control rod drive flange shields used?
- 8.15 Is an ultrasonic tank (or electropolishing) used for cleaning control rod drivers?
- 8.16 Is hydrolazing of control rod drive scram discharge header performed? Are permanent hydrolazing ports installed?
- 8.17 Are in-pool temporary filtering systems used? If so, are they of an acceptable type?

- 8.18 Is the smallest mesh size practicable used for filters in the coolant filtering systems, including the letdown lines reactor coolant pump seals?
- 8.19 Is a reactor head shield used (PWR)?
- 8.20 Do maintenance procedures contain steps to ensure that debris from maintenance, such as cobalt-bearing debris from valve flapping, are cleaned out of the system before the system is closed?
- 8.21 Are component layup procedures used during outages?
- 8.22 Is electropolishing performed of new steam generator channel heads or replacement recirc pipes, possibly followed by prefilming?
- 8.23 Are communications headsets used?
- 8.24 Are automatic packing machines used?
- 8.25 Are automatic welders, weld prepping and pipe cutting machines, valve seat refinishers or other similar techniques employed?
- 8.26 Chemistry controls.
- 8.26.1 Is chemical de . . . performed?
- 8.26.2 Is hydrogen peroxide addition performed in PWR's prior to shutdown to induce crud burst?
- 8.26.3 Is oxygen concentration maintained at 200-400 ppb during hot functional tests in BWR's before power ascension to allow a protective film to form on piping surfaces?
- 8.26.4 Are BWR Chemistry Guidelines followed as detailed in EPRI document NP-3589-SR-LD?
- 8.26.5 Is water conductivity maintained below 0.2 microS/cm in BWR's during operation?
- 8.26.6 Is zinc injection (and Hydrogen Water Chemistry with or without zinc injection) performed in BWR's?
- 8.26.7 Is extended hot functional testing performed in good quality water to prefilm steam generator tubes?
- 8.26.8 Does the licensee avoid sudden drops in pH; maintain pH constant at 6.9; or possibly raise the pH to 7.4? Is a coordinated Li/B Chemistry Program implemented? (PWR's)
- 8.26.9 Is an overpressure of hydrogen (typically 25-30 cc/kg) maintained in PWR primary coolant to keep oxygen below 5 ppb?

- 8.26.10 Review the adequacy of the H<sub>2</sub> addition program versus high total body doses.
- 8.27 Does a program or approach exist to determine if a design change or if a modification that reduces dose is cost beneficial?
- 8.28 Do design engineers or radiological engineers review designs at the conceptual phase to ensure that provisions have been included that will reduce dose and the spread of radioactivity?
- 8.29 Does documentation exist to demonstrate that ALARA design reviews were performed?
- 8.30 Does the licensee have specific radiological design criteria which must be met by all designs?
- 8.31 Do the licensee's 10 CFR 50.59 modification program consider ALARA in their safety reviews?
- 8.32 How is the licensee addressing: source term reduction efforts; environmental T/S involvement to reduce stellite material (e.g., CRDM's, check valve seats); long term plant modifications to clean up source term?
9. Assessment/Self Evaluations
- 9.1 How does the licensee evaluate ALARA performance?
- 9.2 Review and determine the effectiveness of actions taken on internal and contractor audits and assessments.
- 9.3 Are internal audits substantive? How effective is the audit system? What is the frequency of the audits?
- 9.4 Are the qualifications of the personnel performing the audits of the ALARA program adequate?
- 9.5 Are post-job critiques conducted?
- 9.5.1 Is there a minimum man-rem total that needs to be exceeded to initiate a post-job review?
- 9.5.2 Do critiques include all workers and technicians?
- 9.5.3 Are records kept of meetings?
- 9.6 Are annual or outage ALARA reports compiled and distributed? What use is made of them?
- 9.7 Verify that the ALARA program provides for continued review and corrective action for chronic plant radiation problem areas (e.g., hot spots, contaminated drains and pipes in personnel access areas, unnecessary entries into high radiation areas, etc.). Does any



action plan provide for the involvement of system engineers to assist in proposing modifications for those systems with chronic problems?

9.8 Are maintenance reworks reviewed to determine root cause: personnel error during repair, wrong parts, inaccurate diagrams, etc.?

9.9 Are equipment history files reviewed to identify unreliable equipment? Are corrective actions taken to replace this equipment with more reliable equipment?

9.10 What percent of jobs had to be reworked because of personnel error, wrong parts, etc.?

10. Summary

## ALARA TEAM INSPECTION

### SUMMARY GUIDANCE

In the conduction of the inspection the big-picture results that we are trying to achieve should be kept in mind. To assist each inspector in focusing their efforts, think in terms of addressing the following questions in a summary section to each of the main inspection areas. It is acknowledged that many of these questions are unanswerable based on one or two inspections, but if the information is available and can be discussed with an eye towards coupling it with the results of future inspections, than we should try to do so.

#### 1. Background

Has dose history improved, declined or stayed about the same?  
Have any changes been obviously attributable to major programatic changes in the ALARA program?

Why were the high dose jobs so high? Was there any aspects of the jobs that stood out as a major contributor to the high dose, or was it the result of numerous factors?

How does this licensee compare to the industry?

#### 2. ALARA Program/Organization

Is management clearly supportive of maintaining and improving their ALARA program?

Does the overall level of knowledge, attitude and understanding of ALARA by licensee personnel (staff and management) have a noticeable impact on the overall implementation of the program?

Are the defined ALARA program positions (e.g., Coordinator) truly useful positions, with adequate levels of authority, or are some more of a token job with an inadequate amount of input into task decisionmaking.

Does the ALARA suggestion program appear to work? If yes or no, is there an apparent feature that either make it work well or keep it from being effective?

#### 3. Corporate Involvement

Is Corporate involvement in ALARA a help or a hindrance to the plant? Where can they improve and what are they doing that appears to be beneficial?

#### 4. Training

Are personnel being adequately trained in ALARA? Are the right people being trained and is the training sufficient in scope and depth? Is it a

good or poor training program? Are the instructors capable and well qualified? What are the program weaknesses, if any?

5. Management Goals

Are the goals established reasonable? Is there a sound basis for the goals that are established, or are they "politically" motivated? Does having goals help the program achieve lower doses?

6. ALARA/RWP Procedure Implementation

Are the procedures adequate in scope and depth to enable the ALARA program to function without being either burdensome or overlooked?

Do they adequately implement the ALARA program? What are the program strengths and what are the weaknesses that need to be improved?

Did staff appear to be adequately incorporating good ALARA practices into their work assignments, or did they appear to do only do the minimum necessary to get by?

7. Planning /Scheduling

Are the projected doses for jobs reasonable? Or do they tend to be habitually over or under the estimate doses? If so, can we ascertain why?

Is job planning adequate in lead time and depth to allow for adequate implementation of the ALARA program?

Do they adequately implement the ALARA program? What are the program strengths and what are the weaknesses that need to be improved?

8. ALARA Initiatives/Operational Practices

Is the licensee aggressive in trying to implement new operational methods and practices in the pursuit of maintaining doses ALARA?

Do they adequately implement their operational initiatives and practices to obtain the maximum benefit from them, or are they poorly and/or slowly carried out?

9. Assessment/Self Evaluations

Is the licensee learning from previous experiences and adequately incorporating lessons learned into future work?

Has the licensee been good at identifying weaknesses in their program, or do they appear to be making the same mistake?

What is the cause of significant overexposure at the plant?

Is there a common root cause for significant overexposures?

10. Summary

Does their ALARA program overall appear to be effective? Are there particular portions of the program that stand out as particularly good or particularly poor? What should the licensee continue to do, and where do they need to improve?