

Nuclear Power Business Unit
RADIATION WORK PERMIT

Revision: 0

RWP Number: 04-182

TASK 1: Replace Cono-Seal bullet and Associated work

Radiation Protection personnel are authorized to suspend work activities in the event of a change in job scope, changes in radiological conditions, or a failure of personnel working under the RWP to abide by the RWP conditions.

Stop Work Dose Rate: 5000mR/hr ED Dose Rate Alarm: 2500mR/hr ED Dose Alarm: 1200mrem

Radiation Protection Hold Points: N/A

Contact RP prior to entering any High Radiation Area

Workers shall not handle any debris or foreign material without a survey and permission from RP

When accessing a LHRA notify RP supervision prior to the entry and immediately upon completion of the entry.

Authorized Radiological Work Areas: Any RWP permits entry into RCA(s), RMA, and RA.

HRA LHRA VHRA Cmt. Reactor Critical
 CA HCA HPCA Airborne Radioactivity Area

But not w/ 2' H₂O in upper cavity.

Expected Radiological Conditions: Data From: Current Survey Historical Data Estimated

Radiation: GA 150 to 2000 mrem/hr Contact: 1200 to 2500 mrem/hr

Contamination: 20K to >1E6 dpm/100 cm² Internal Contamination: N/A to N/A dpm/100 cm² (estimated)

Airborne Radioactivity: <1.0 DAC P I₂ NG ³H (Estimated / Actual DAC)

RP Job Coverage: Routine Direct Start of Job System Breach Pre-Job Briefing Required

Special Instructions: Timekeeping will be the primary means of dose control with Teleview being used to monitor exposure as secondary means. Telex radios to be used for communication.

Radiological Survey Requirements:

A. Radiation: Prior to/Start of Work System Breach Other

Special Instructions: Verify conditions prior to entry. RP perform hot particle survey after exit from cavity. Additional surveys as per RP.

B. Contamination: Prior to/Start of Work System Breach Other

Special Instructions: Survey of man-basket upon job completion, Decon as necessary. Additional surveys as per RP.

C. Airborne: Prior to/Start of Work System Breach Other

Special Instructions:

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III. Dose Assessment: TLD and EPD required.

Special Instructions: Relocation of dosimetry dependent on dose rates.
Timekeeping required when working in a dose rate >1,500 mR/hr and the worker could receive more than 25 mrem.

IV. Protective Clothing

- Coveralls, Booties, and Rubber Gloves (Minimum requirements for entering a contaminated area)
- Labcoat, Booties, and Rubber Gloves may be used only with RP permission.
- Coveralls, Double Booties or Booties and Rubber Totes/Boots, and Double Rubber Gloves for HCA entry.
- Double coveralls, Double Rubber gloves, Double Booties, Rubber Totes/Boots.¹
- Plastic suit, or water resistant coveralls, Double Rubber Gloves, Double Booties, Rubber Boots, Hood, and Face Shield for entry to cavity. ¹(Face Shield not required when wearing a respirator)
- Surgeon's Gloves may be substituted for Rubber Gloves with RP permission.
- Hood and Face Shield required.
- Other: See Special Instructions ¹ Safety review may be required for additional coveralls or plastics.

Special Instructions: Additional requirements as per RP.

V. Respiratory Protection: N/A TEDE ALARA Review:

Special Instructions: _____

VI. Engineering Controls:

Special Instructions: Shielding to be provided by adding 2ft of water above the reactor vessel flange.

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VII. ALARA Requirements:

See ALARA Review

LDWA: To be identified by RP.

Special Instructions: Foreign debris found within the refueling cavity may be highly radioactive and shall not be handled without RP permission.

- When working in these areas or handling equipment from these areas (such as refueling tools) workers shall monitor at approximately every two hours.
 - Contact RP immediately if, during monitoring of protective clothing, the worker discovers >10,000 cpm above bkg using a frisker or >5 mRem/hr above bkg using an open window beta instrument.
 - Contact RP immediately if, during monitoring of skin, personal clothing, or modesty garments any contamination above bkg is discovered.
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Point Beach Nuclear Plant
Level 3 Pre-Job ALARA Review

ALARA Review Number: 2004-0027 U1R28	Estimated dose: 1.500	Rem
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Part 1: Job Description	
A. Job Description (Attach work list if appropriate)	<p>Replace bullet nose on thermocouple port column. This will entail working from a man basket hanging from the polar crane. Two maintenance workers will enter the refueling cavity in the man basket to replace the bullet nose. The o-ring will be replaced, the bullet nose placed over the thermocouples, and the retaining clip installed. The total time for the evolution is <u>expected to be 30-45 minutes in the cavity.</u></p> <p>The dose rate at the thermocouple port column is <u>expected to be 2000 mR/hr.</u> If RP cannot perform an adequate survey from the manipulator bridge then a survey from the man basket will be required. <u>RP should use a teletector or equivalent to maintain as much distance as possible between the man basket and the upper internals. This activity is expected to take 15 minutes in the refueling cavity and cost 0.100 person-rem.</u></p> <p><u>The activity of placing the bullet nose over the thermocouples is expected to take 30 minutes and cost 1.300 person-rem.</u></p> <p>Additional dose for support activities is expected to cost 0.100 person-rem.</p>
B. Controlling job procedures.	W.O. 0407919
C. Job History/O.E./Lessons Learned	No job history exists. See attached for O.E.
D. Dose history.	No dose history exists for this job.

Part 2: ALARA Checklist

NOTE: The following exposure reduction measures should be considered during job planning.

Section 1: Pre-Job Planning/	
E. Designated low dose waiting/staging areas.	Low dose areas will be on the 66' of the containment building and will be identified by blue triangles.
F. Remote job coverage equipment.	Timekeeping will be the primary means of dose control. Televue will be used to monitor worker exposure as a secondary means of dose control.
G. Communication devices used.	<u>Telex radios</u> will be used for the workers to communicate.
H. Services required. (lighting, air, electrical)	<u>The polar crane will be used for the man-basket.</u> No other special services will be required.
I. Designated work area access/exit points.	U-1 containment 66' el.
J. Coordination with other groups.	Maintenance and RP for the actual cavity work. <u>Operations will fill the refueling cavity to the required level.</u>

Point Beach Nuclear Plant
Level 3 Pre-Job ALARA Review

ALARA Review Number: 2004-0027 UIR28	Estimated dose: 1.500	Rem
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K. Work performed outside of radiation areas: Prefabrication Disassembly Assembly	Man basket preparations will be made on the 66' of containment in a low dose area.
L. Post-job cleanup requirements.	The man basket will require a survey after the job is complete and may require decontamination.
M. Special tools/equipment used to minimize time and exposure. (Use contaminated tools when practicable)	None
N. Radwaste minimization.	No Radwaste will be generated from this activity.
O. Work activities/equipment status that could result in significant interruption of job or changes in radiological conditions.	Draining of the refueling cavity would result in a loss of shielding. Polar crane malfunction could cause job delays.

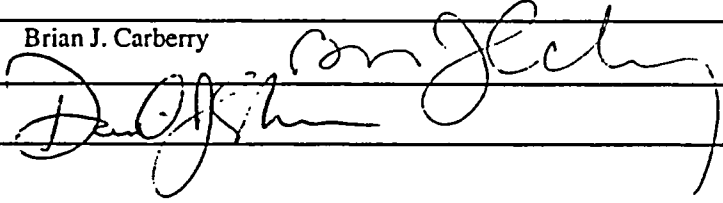
Section 2: Radiological Controls	
P. Describe temporary shielding to be used.	Water level in the upper cavity will be raised until it is approximately two feet above the reactor vessel flange. This will provide shielding from the reactor vessel and portions of the upper internals.
Q. What systems/components will be filled with water or flushed to reduce job area dose rates?	None
R. Engineering controls to control airborne activity. (HEPA filters, glove bags, etc.)	No engineering controls will be used. The bullet will not be contaminated and the thermocouple contamination levels are low. Approximately 20,000 dpm/100cm ² . <u>The upper internals are dry and highly contaminated.</u> Experience shows that attempting to wet or mist the upper internals causes airborne activity in the cavity and on the 66'. The possibility exists that air currents caused by performing work from the man basket could cause airborne activity in the upper cavity. <u>Past history shows that strong air currents can cause airborne activity on the 66'.</u> See TEDE ALARA review for this work.
S. Attach applicable survey data.	Dose rate information should be discussed at pre-job briefings. The dose rate information used to create the dose estimate for this job is based on previous surveys. Actual dose rate information will be obtained prior to starting work. <u>RP Supervision shall authorize the start of work based on actual survey data.</u>

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ALARA Review Number:	2004-0027 U1R28	Estimated dose:	1.500	Rem
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Section 3: Worker Preparation and Training	
T. Consider the following: <ul style="list-style-type: none">• Experienced workers selected.• Special training, photos, drawings, video tapes available• Rehearsal• Mock-up training• Use of fewer workers evaluated• Method of shift turnovers	Workers experienced in installing the bullet noses will be used.

ALARA-As Low As Reasonably Achievable
RWP-Radiation Work Permit
HEPA-High Efficiency Particulate Air

Completed By: Brian J. Carberry	Date: 4-22-04
Approved By: 	Date: 4-22-04

TEDE ALARA EVALUATION

RWP 04-182

DESCRIBE THE WORK TO BE PERFORMED (DOSE RATES, EST. AVERAGE AIR CONCENTRATIONS, CONTAMINATION LEVELS):
 Replace bullet nose on thermocouple port column. This will entail working from a man basket hanging from the polar crane. Two maintenance workers will enter the refueling cavity in the man basket to replace the bullet nose. The o-ring will be replaced, the bullet nose placed over the thermocouples, and the retaining clip installed. The total time for the evolution is expected to be 30-45 minutes in the cavity.

Dose rates in the work area are expected to be 2000 mR/hr. Expected contamination levels are 20,000 dpm/100cm². Air currents caused by movement of the man basket in the refueling cavity could cause airborne activity. Contamination levels on the upper internals are expected to be 60 to 80 mrad/hr beta/gamma. Long-lived alpha contamination levels are unknown. Although alpha contamination levels are unknown, an estimate can be made using the $\beta\text{-}\gamma/\alpha$ ratio from areas that connect to the underhead area. i.e. conoseals. A conoseal contamination survey indicated that the $\beta\text{-}\gamma/\alpha$ ratio is approximately 100,000/50 dpm/100cm². If the beta-gamma contamination is 60-80 mRad, then the estimated alpha contamination (using 1 mRad = 100k) is 3000 dpm/100cm². From HPIP 4.40, the alpha adds approximately 0.4 to the DAC-fraction for a normal ventilation area. Estimated work duration is 15 minutes per worker per entry at the job site. The estimated beta/gamma DAC fraction from HPIP 4.40 for routine maintenance work in a normally ventilated area is in the range of 1.8 to 2 DAC.

DESCRIBE THE ENVIRONMENTAL CONDITIONS AND EFFECTS ON PERSONNEL SAFETY:

The work area is located in the refueling cavity. Normal containment ventilation.

DESCRIBE PROCESS AND ENGINEERING CONTROLS TO BE USED:

None.

DESCRIBE THE PROTECTIVE EQUIPMENT AND CLOTHING, INCLUDING THE RESPIRATOR, TO BE USED AND THEIR EFFECTS ON WORKER EFFICIENCY:

The work involves work in a high contamination area. Protective clothing will consist of normal dress for a high contamination area. Worker efficiency will not be impaired.

DESCRIBE POTENTIAL POST-ACTIVITY NEGATIVE IMPACTS (E.G., PERSONNEL DECONTAMINATION AND SKIN DOSE ASSESSMENTS, PORTAL MONITOR ALARMS):

Due to the high contamination levels, it is possible that without the use respiratory protective equipment personnel could become contaminated. This would result in portal monitor alarms, the need for personnel decontamination, skin dose assessments, whole body counting and internal dose assessment.

DOSE WITHOUT RESPIRATORY PROTECTION:

[Time (hrs) x Dose rate (mR/h)]	0.25 x 2000	=	<u>500</u>	mrem, external dose
[Time (hrs) x DAC fraction x 2.5 mR/DAC-h]	0.25 x 2.4 x 2.5	=	<u>1.5</u>	mrem, internal dose
Est. dose for implementing engineering or process controls		=	<u>0</u>	mrem
Total		=	<u>502</u>	mrem

DOSE WITH RESPIRATORY PROTECTION:

[Time (hrs) x Dose rate (mR/h)]	500 x 1.15	=	<u>575</u>	mrem, external dose
[Time (hrs) x DAC fraction x 2.5 mR/DAC-h / Respirator PF]	1.7 / 50	=	<u>0</u>	mrem, internal dose
Est. dose for implementing engineering or process controls		=	<u>0</u>	mrem
Total		=	<u>575</u>	mrem

Note: Time value should reflect worker efficiency impact due to respirator use.

ALARA RECOMMENDATIONS:

X	Without respirator	Type:	<input type="checkbox"/> Negative Pressure/PAPR	<input type="checkbox"/> Airline/Hood	<input type="checkbox"/> SCBA
	With respirator				
	As indicated below				

Justification/Comments: The chance of airborne activity as a result of this job is slight. The work is being performed on equipment that has a low contamination level. The only concern is that air currents could cause airborne activity from the highly contaminated upper internals. The work is taking place in very high dose rates and the extra dose that would be received as a result of lower worker efficiency is not justified.

Preparer (Name/Date): Brian J. Carberry 4/22/04

Approver (Name/Date): *Paul J. ...* 4/22/04