

UNITED STATES

**REGION IV** 

611 RYAN PLAZA DRIVE, SUITE 400 ARLINGTON, TEXAS 76011-8064

November 22, 1994

Washington Public Power Supply System ATTN: J. V. Parrish, Assistant Managing Director for Operations 3000 George Washington Way P.O. Box 968, MD 1023 Richland, Washington 99352

SUBJECT: MANAGEMENT MEETING WITH WASHINGTON NUCLEAR PROJECT-2

This refers to the meeting conducted in the Region IV office in Arlington, Texas on November 8, 1994. This meeting was held to discuss your radiation protection and emergency preparedness programs. The meeting was attended by the people listed on the attached Attendance List.

The subjects discussed at this meeting are described in the enclosed Meeting Summary. It is our opinion that this meeting was beneficial and has provided a better understanding of your efforts and initiatives. In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter will be placed in the NRC's Public Document Room.

Should you have any questions concerning this matter, we will be pleased to discuss them with you.

Sincerely,

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Samuel J. Collins, Director Division of Radiation Safety and Safeguards

Docket: 50-397 License: NPF-21

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Enclosure: Meeting Summary w/attachments

cc w/enclosure: Washington Public Power Supply System ATTN: J. H. Swailes, WNP-2 Plant Manager P.O. Box 968, MD 927M Richland, Washington 99352-0968

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Washington Public Power Supply System

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Washington Public Power Supply System ATTN: G. E. C. Doupe, Esq. 3000 George Washington Way P.O. Box 968, MD 396 Richland, Washington 99352-0968

Energy Facility Site Evaluation Council ATTN: Frederick S. Adair, Chairman P.O. Box 43172 Olympia, Washington 98504-3172

Washington Public Power Supply System ATTN: D. A. Swank, WNP-2 Licensing Manager P.O. Box 968 (Mail Drop PE20) Richland, Washington 99352-0968

Washington Public Power Supply System ATTN: P. R. Bemis, Regulatory Programs Manager P.O. Box 968 (Mail Drop PE20) Richland, Washington 99352-0968

Benton County Board of Commissioners ATTN: Chairman P.O. Box 190 Prosser, Washington 99350-0190

Winston & Strawn ATTN: M. H. Philips, Esq. 1400 L Street, N.W. Washington, D.C. 20005-3502 Washington Public Power Supply System

bcc to DMB (IE06)

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L. J. Callan DRSS-FIPB File Branch Chief (DRP/E, WCFO) Senior Project Inspector (DRP/E, WCFO) Leah Tremper (OC/LFDCB, MS: TWFN 9E10) B. Beach, D/DRP K. Kirsch, WCFO R. Doda, SLO B. Beach Resident Inspector MIS System RIV File Branch Chief (DRP/TSS) B. Henderson (PAO, WCFO) J. Dyer, DD/DRP K. Perkins, WCFO J. Gilliland, PAO

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OFFICE	RIV:FIPB	C:FIPB (	DD:DRSS	D: DRSS) E	
NAME	THAndrews:nh	BMurray WW	RAScarano	SJC611ins	/
DATE	11/9/94 THA	1 /1 /94	/ /94	11/10/94	

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Washington Public Power Supply System

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bcc to DMB (IEO6)

L. J. Callan DRSS-FIPB File Branch Chief (DRP/E, WCFO) Senior Project Inspector (DRP/E, WCFO) Leah Tremper (OC/LFDCB, MS: TWFN 9E10) B. Beach, D/DRP K. Kirsch, WCFO R. Doda, SLO B. Beach Resident Inspector MIS System RIV File Branch Chief (DRP/TSS) B. Henderson (PAO, WCFO) J. Dyer, DD/DRP K. Perkins, WCFO J. Gilliland, PAO

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#### ENCLOSURE

#### MEETING SUMMARY

Licensee: Washington Public Power Supply System 3000 George Washington Way P.O. Box 968, MD 1023 Richland, Washington 99352

Facility: Washington Nuclear Project - 2

License: NPF-21

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Docket: 50-397

Subject: MANAGEMENT MEETING WITH WASHINGTON NUCLEAR PROJECT - 2

On November 8, 1994, representatives of Washington Public Power Supply System met with Region IV personnel in Arlington, Texas, to discuss their radiation protection and emergency planning programs. The attendance list is attached as Attachment 1 to this letter. Licensee handouts at the meeting are attached as Attachment 2.

The meeting agenda included opening remarks, introduction of attendees, discussion of person-rem exposures, and emergency preparedness activities.

Attachments:

1. Attendance List

2. Meeting Handouts (two handouts)

#### ATTACHMENT 1

#### ATTENDANCE LIST

Attendance at the management meeting between Washington Nuclear Power Project and NRC on November 8, 1993:

#### LICENSEE

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- J. Albers, Radiation Protection Manager
- W. Barley, Corporate Radiation Health Officer
- P. Bemis, Manager of Regulatory Programs
- G. Reed, Manager of Emergency Preparedness
- R. Webring, Support Services Manager

NRC

- R. Scarano, Deputy Director, Division of Radiation Safety & Safeguards (DRSS) B. Murray, Chief, Facilities Inspection Program Branch (FIPB)/Reactor
- Inspection Branch (RIB)
- T. Andrews, Radiation Specialist, FIPB
- G. Guerra, Radiation Specialist, FIPB
- W. Holley, Senior Radiation Specialist, FIPB
- L. Ricketson, Senior Radiation Specialist, FIPB
- A. McQueen, Émergency Preparedness Analyst, RIB
- D. Spitzberg, Senior Emergency Preparedness Analyst, RIB



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# **RADIOLOGICAL PERFORMANCE**

### WNP-2 RADIOLOGICAL PERFORMANCE

### AGENDA

### • R-9 Refueling Outage Summary

- Drywell
- Balance of Plant
- Refuel Floor
- Current and Planned Radiological Initiatives
- Strategic Dose Planning

# **R-9** Exposure Data

R-9 Duration Estma	te		60 Days
<b>R-9</b> Actual Duration	1		91 Days
Outage Estimate			690 P-Rem
Outage Goal		ł	650 P-Rem
Actual			740 P-Rem

Exposure By Area	
	<b>.</b>
Area	Actual Exposure
Drywell	502 P-Rem
Refuel Floor	52 P-Rem
Balance of Plant	186 P-Rem

Emergent	Work
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Added Work Scope	Actual Exposure
Penetration Work	13 P-Rem
Underwater Light Retrieval	9.7 P-Rem
RRC Gamma Spectroanalysis	1.7 P-Rem
3 CRDs added to Original 30	6.0 P-Rem
Surrogate Tour	1.6 PR-em

TOTAL	32 P-Rem



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## Drywell Dose Summary

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Exposure Summary:	P-Rem
MSIP Activities	131.150
CRDM Rebuild	105.922
Misc. Drywell Tasks	57.110
NDE/ISI	39.150
Valve Work	29.867
Drywell Shielding	23.957
H.P. Drywell Coverage	21.699
Surveillance/VT-2	20.043
Snubber Test/Optimize	15.036
MSRVs	14.389
MOVATs	13.745
Labor Support	12.669
Elect. Penetrations	10.301
LPRMs	<u>6.699</u>
TOTAL	501.737

# **Outage Dose Estimates vs. Actual Exposures**

Work Description	Estimate	Actual
MSIP for RPV Nozzle Welds	140.530 P-Rem	131.150 P-Rem
Drywell Shielding and Removal	22.961 P-Rem	23.957 P-Rem
Remove/Replace CRDs Undervessel	21.290 P-Rem	23.014 P-Rem
RPV Assembly/RPV Head Work to Completion	9.910 P-Rem	8.135 P-Rem
Inspect/Repair/Modify RHR Valves in Drywell	5.668 P-Rem	4.975 P-Rem
Reactor Cavity Decontamination	<u>5.385 P-Rem</u>	<u>7.060 P-Rem</u>
TOTALS	205.744 P-Rem	198.273 P-Rem

## **Drywell Dose Reduction Techniques**

#### **MSIP**

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#### Dose Savings

•	Extensive planning	28.0 P-Rem
•	Shielding - reduce contact/general area dose rates	182.5 P-Rem
•	RMS system, audio/video	31.4 P-Rem
•	New insulation storage techniques	<u>4.2 P-Rem</u>
		246.1 P-Rem

#### **Undervessel Activities**

•	Subpile floor flooded with water	37.0 P-Rem
•	ALÂRA Shields were installed on (185) CRDM flanges	49.5 P-Rem
•	Verified that shoot-out steel can be removed selectively.	Future Savings
•	All CRDMs were unlatched prior to CRD replacement.	7.0 P-Rem
		93.5 P-Rem

### **Miscellaneous Drywell Activities**

•	Flushing of RWCU-V-101/103 and RWCU suction Manif	fold 33.8 P-Ren	m
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Permanent Drywell shielding (annual installation dose savings) 3.0 P-Rem 15.0 P-Rem

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- Good interface between support crafts
- Planning meetings for key high dose jobs. •

<u>unassigned</u> 51.8 P-Rem

Total Dose Savings 391.4 P-Rem



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### Drywell Lessons Learned

- Source term reduction undervessel and in the Rebuild Room needs improvement. Exposures in these two areas can be potentially cut in half.
- RPV nozzle flush was inconclusive. RMS was used for monitoring dose rates and exposure while sac shield doors were closed.
- More effective source term reduction methods must be investigated for invessel work.
- More effective mock-up training for CRD work is needed.
- Neutron detector (SRM, IRM, LPRM) cable damage from CRD and LPRM evolutions cost 5.9 P-Rem.
- Jet pump cleaning from the refuel floor increased RWCU dose rates by a factor of 50 (average), costing approximately 9.0 P-Rem and potentially 22.0 P-Rem.
- N2 RPV nozzles increased by a factor of two as a result of jet pump cleaning. A loss of 4.0 P-Rem occurred.
- Premature draindown of systems such as RRC loop "B" resulted in dose rate increases by a factor of three for up to 30 days. A loss of 6.0 P-Rem was the result.
- Waste Management needs improvement in the CRD Rebuild Room.

## **Balance of Plant Dose Summary**

MOVATS	19.179 P-Rem
ISI	7.892 P-Rem
Valve Work (RX Bldg)	6.549 P-Rem
SDV Valve Work	5.555 P-Rem
CRD HCUs (Accumulators)	4.706 P-Rem
CSP-V-3/4 Replacement	4.476 P-Rem
W/W Work (Containment Vac. Brkrs)	4.429 P-Rem
Desludge/Inspect W/W	3.966 P-Rem
CEP-V-1A/2A Replacement	3.936 P-Rem
LLRT (RX Bldg)	3.857 P-Rem
Retrieve Underwater Light- RHR Pump B	2.058 P-Rem
Surrogate Tour	1.557 P-Rem
RHR V-3A Repair	1.114 P-Rem
RWCU Pump Rms Misc Work	2.235 P-Rem
RWCU Hold-up Pump Rms Misc Work	2.126 P-Rem
Reactor Bldg Misc Work High-Rad	4.327 P-Rem
RHR-HX-1A Eddy Current Inspection	2.476 P-Rem
Modify MSRs	2.685 P-Rem
Modify/Inspect/Repair FW HX'ers	1.033 P-Rem
W-6 Sump Pit Decon	0.793 P-Rem
TG Misc Breaches/Repairs	2.409 P-Rem
Complete RPV Notching Mod.	1.130 P-Rem
TG Misc Work (No Breaches)	3.122 P-Rem
Misc Work - Non High-Rad Group RWPs	85.000 P-Rem
BOP Minor Misc Work	<u>9.343 P-Rem</u>

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TOTAL

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185.953 P-Rem

### Balance of Plant Dose Reduction Techniques

### **MOVATS/ISI**

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• Shielding/Flushing - reduced Contact/GA Dose Rates. 10.6 P-Rem

### Wetwell Desludge/Inspection

•	Removed 29.68 Curies (70.8% Co-60) from Suppression	
	Pool prior to inspection.	Future Savings
•	Performed Mock-ups prior to sludge filter transfer.s	2.0 P-Rem

#### Surrogate Tour

•	Experienced Equipment Operator and SS HP Tech.	
	to escort photographer.	0.4 P-Rem
•	Surrogate Tour System available for use November 1994.	Future Savings
•	TG Bldg photographed while shutdown.	5.0 P-Rem

### **Underwater Light Retrieval**

•	Personnel entry into suction side of RHR Pump B		
	rather than pump disassembly/reassembly	SJ	10.7 P-Rem

#### **CRD HIC Disassembly**

• Utilized lessons learned, photographs, and experienced personnel for assembly/disassembly 0.50 P-Rem

### **Balance of Plant** Dose Reduction Techniques (cont.)

### Scaffolds

<ul> <li>Increased communication with craft supervision to ensure work completion prior to teardown.</li> </ul>		(no estimate)	
•	Utilized ladders & lifts when possible.	(no estimate)	

### Cameras

20 cameras installed in High-High Radiation Areas for year-round use. 16 of these cameras are located in TG Bldg 10.0 P-Rem and were installed during shutdown

(+Future Savings)

+39.2 P-Rem Total Dose Savings

### Balance of Plant Specific Flush Results For Dose Reduction

MWR	Line	Loop	near	W	/W	Hatch
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46 Rem/hr reduced to 100 mRem/hr

RWCU-V-136 on TIP Rm. Mezzanine

Seal Line on "B" RHR Pump

RWCU-V-105 in RWCU HX Rm

RWCU-V-233B in Holdup Pmp Rm "B"

RWCU-V-450 in Holdup Pmp Rm "B"

RHR-V-155 in 522' RX So. Vlv Rm

RFW-V-70/71 on TIP Mezzanine

Between RWCU-V-237B/238B

RWCU-V-233A in Holdup Pmp Rm "A"

12 Rem/hr reduced to 4 Rem/hr

80 Rem/hr reduced to 15 Rem/hr

8 Rem/hr reduced to 600 mRem/hr

200 Rem/hr reduced to 2 Rem/hr

500 Rem/hr reduced to 7 Rem/hr

15 Rem/hr reduced to 30 mRem/hr

24 Rem/hr reduced to 180 mRem/hr

200 Rem/hr (no reduction)

200 Rem/hr increased to 750 Rem/hr

## Balance of Plant Examples of Successes

٠	Desludging of the Wetwell	Removed 677 lbs. of sludge (29.68 Curies) 70.8% Co-60, 20.8% Fe-55, 6.2% Zn-65, 1.1% Mn-54
٠	W-6 Sump/Equipment Pit	Drained, deconned and painted for maintenance.
•	EDR-P-19 Replacement	Replaced pump and associated level switches in W-6 Offgas Equipment Pit. This was a Control Room Deficiency.
٠	CRD-LS-13E Replacement	Replaced level switch on SDV Tank. This was a Control Room Deficiency.
•	NDE E/C Insp.Loc. 126-2	The successful flush of RWCU-V-105 enabled NDE to perform a very desired Erosion/Corrosion inspection.
•	Surrogate Tour	All areas within the RCA were photographed to create this tool which should be of great benefit to all who utilize it. Approximately 84,000 pictures taken.
•	Light Retrieval	The retrieval of the underwater light from the RHR pump well via the spool piece versus pulling the pump resulted in a net savings of 10.662 P- Rem and approximately three days of work.
•	Modify MSRs	This was a three Megawatt Improvement Project in which over 14,000 P-hours were charged. $CO_2$ blasting was utilized to successfully reduce the contamination levels inside the MSRs so that protective clothing requirements could be relaxed.
٠	Camera Installations	Twenty cameras were set up for year around use in Reactor, Radwaste, and the Turbine Buildings.
•	CRD HIC Disassembly	This task was accomplished with less exposure than it ever has in the past. With a final actual exposure total of 0.531 P-Rem, this job compared favorably with R-5's $\sim$ 0.700 P-Rem and R-7's 1.215 P-Rem totals. First time that there was not a loss of contamination control event.

### **Balance of Plant** Suggestions For Improvement

- Incorporate shielding and flushes into the original planning of jobs.
- Establish a flushing program with identified individuals and their responsibilities.
- Establish a flushing program that includes preventative flushing throughout the year.
- Dead legs and unused lines to be cut out of A & B RWCU Holdup Pump Rooms.
- Reduce the amount of Work Order Tasks therefore reducing ALARA Tasks.
- Manpower to support engineering analysis for permanent shielding to be increased.

# **Refueling Floor Dose Summary**

Exposure Summary:	P-Rem
Reactor Disassembly (Cavity)	5.107
Reactor Reassembly (Cavity)	14.905
Floor Support Rx Assembly	15.318
In-Vessel Maintenance	9.363
Reactor Cavity Decon	<u>7.060</u>
Total	51.753
Impacts to Actual Exposure Totals	
Activity	Dose Cost
• Loss of underwater lights	9.66 P-Rem
• Inability to remove cavity white iron water for decon	2.3 P-Rem
• Refueling mast replacement	0.266 P-Rem
• Inexperienced personnel for nozzle flushing	(no estimate)
• Cavity wall soddening system - not installed	1-2 P-Rem

## **Refueling Floor Summary Dose Reduction Techniques**

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### Dose Savings

•	Pre-outage shielding of the New Fuel Prep Machines	0.242 P-Rem
•	SFP Skimmer/crud ring pre-outage decon	0.500 P-Rem
•	Previous outage removal of grating supports in cavity	2.000 P-Rem
•	Pre-outage lowering of CRBs in SFP	0.500 P-Rem
•	Pre-outage replacement of Refueling Mast	1.000 P-Rem
•	Low dose waiting areas identified on the floor	(no estimate)
٠	Planning meetings for key high exposure jobs	(no estimate)
•	Input from Radwaste Group for processing waste materials	(no estimate)
•	Remote scrubbing of the Inner Bellows area	2.000 P-Rem
•	Installation of the Steam Dryer (17 minutes)	(no estimate)
•	Cavity decontamination using strippable paint	2.700 P-Rem
• •	No respirators issued for Rx work (better communications)	(no estimate)
•	Installing the RPV Head cover on head prior to setting the head in the cavity for decon.	(no estimate)
•	Using an Equipment Pool Shield Block to reduce the dose on the Refueling Bridge from 100 mRem/hr to 40 mRem/hr during underwater light retrieval.	<u>0.650 P-Rem</u>
TOT	ALS	9.592 P-Rem





940794.7 Nov 4, 1994

# KEY PERFORMANCE INDICATORS FY1995

Mission Statement Washington Public Power Supply System provides cost-competitive, reliable electric energy to benefit Northwest ratepayers, in a safe and environmentally responsible manner, in cooperation with the Bonneville Power Administration and the region's utilities.

## Key Performance Indicators

- Lost Time Accident Rate
- Cost of Power
- Notice of Violation Rate

### **RADIATION EXPOSURE**

### ALARA - As Low As Reasonably Achievable

Non-outage less than 241 person-rems Note: 107 person-rems for the ECCS Pump Room painting





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### SOURCE TERM REDUCTION

- Disposal of Radwaste Backlog
- GE Fuel Scrapping
- GE CRUD Transport Study (Iron Injection, GEZIP)
- System Flushing
- Undervessel Sump Clean-Up
- Equipment Pool Decon
- Fuel Pool Decon
- Install FDR & EDR Sump Sensing Probes
- Chemical Decon RWCU
- Control Rod Blade Replacement
- Corrosion Layer Analysis Program

- Equipment Drain Heat Exchanger Removal
- Nozzle Flushing
- HCU Accumulator Replacement
- Equipment Pool Drain
- FPC Flushing
- RWCU P-27/P-28 Pump Drain Removal
- RWCU Hold-up Pump Room Modifications
- SDV Permanent Shielding
- Permanent Shielding-Rx Bldg, Drywell

### PERSON-REM REDUCTION

- Permanent Shielding Reactor Building
- Surrogate Tour/Video Maintenance
- Robotics
- Cameras Turbine, Reactor & Radwaste Bldgs.
- Mechanical Stress Improvement Program (MSIP)
- Remote Monitoring System (RMS)
- Senior Site ALARA Committee
- Reduced Respiratory Protection Usage
- CRD Rebuild Room Modifications
- Reduced PM's
- Grouping Surveillances by Areas rather than System
- Remove Acoustic Monitoring System
- Snubber Reduction
- TES Electronic Access Control
- GET Practical Factors Upgrade





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### WNP-2 EMERGENCY PREPAREDNESS

- Organization
- Background and Staff Qualifications
  - --- Support Services Manager
  - --- Emergency Preparedness Manager
  - --- Planning Staff
    - 9 Planners
    - Average 4 years experience in EP/ 12 years nuclear experience
    - l Planner SRO certified on WNP-2,
      l Planner previously SRO licensed (HTGR)
    - Staff offsite training includes: FEMA Evaluator Certification, FEMA REP Planning-EMI, FEMA-RER, INPO EP Coordinator Course
    - Previous work experience includes: HP, Training, QA, Security, Operations, Licensing



- Previous Performance
  - --- SALP 2 Rating Since 1989
  - --- 1991 Exercise

Exercise Weakness: ENS communicator left the line unattended while gathering information

Exercise Resolution: Installed portable phone capability for the ENS communicator

--- ·1992 Exercise

Exercise Weakness: Failure to classify GE

Exercise Resolution: Procedure clarification and training

Open Item: TSC habitability not sufficiently controlled

Open Item Resolution: Training of ERO, closed in 1993 exercise

--- 1993 Exercise

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Exercise Weakness: Exceeded 1 hour response time for 1 responder

Exercise Resolution: Installed an additional transmitter and performed numerous notification and response tests, closed in early 1994 by observed performance

Exercise Weakness: KI not administered to plant emergency workers when criteria exceeded

Exercise Resolution: Procedure simplification for KI issuance, NRC observed tabletop session and closed the weakness closed in late 1993

--- 1994 Ingestion Pathway Exercise

Overall good performance - objectives met

<u>Utility Evaluation</u> -- No weaknesses, 9 strengths, 5 significant areas for improvement, 82 overall recommendations for program improvement

NRC Evaluation	(IR 94-23)	 No weaknesses,
		no new inspection
		findings, 6 items
		for potential
		improvement

• Program Support - Onsite

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- --- 5 team rotations
- --- Facility upgrades implemented
- --- Good support for scenario development
- --- Maintenance developed props
- --- Scenario planners and simulator personnel cooperation
- --- Center director leadership
- --- Senior management support (considered a key to WNP-2's success)
- Program Support/Participation Offsite
  - --- Good working relations with state and county personnel
  - --- State of Washington Emergency Management leading offsite coordination
  - --- Onsite and offsite player integration excellent during Exercise
  - --- Supply System costs for offsite agencies high

• FEMA Region X

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- --- New RAC Chairman
- --- Good past relations with FEMA both at state and local levels
- --- Relations expected to remain good
- --- Recent exercise closed 30 of 33 open ARCAs

- Program Self-Assessment
  - --- Quality Assurance Assessments
    - Annual audit (includes state agency participation)
    - Surveillances 4 in past 12 months
    - Indirectly through participation in the ERO
  - --- Internal evaluation of drill and exercise performance
    - by Supply System and peer evaluators
    - by Senior Management/Industry Expert
  - --- INPO Assistance Visit conducted in May 1994

• Looking Forward

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- --- Training improvements
  - Position specific (task based/team based) training for initial/annual refresher training
  - Use of mini-drills and center specific drills
  - Continue involvement with offsite agencies in drills
  - Improve staff skills through SRO certification training and available courses in the industry
- --- NUMARC EAL implementation
- --- Complete and maintain the six year plan
- --- Consolidate and simplify EP Implementing Procedures
- --- Install a new ERO notification system
- --- Streamline ERO lead position and implementation
- --- Severe accident management and implementation