

# **ALARA EXPERIENCE**

**Progress of the Comanche Peak  
ALARA Program**

**John Blaikie**

**TXU Electric**

**Comanche Peak S.E.S.**

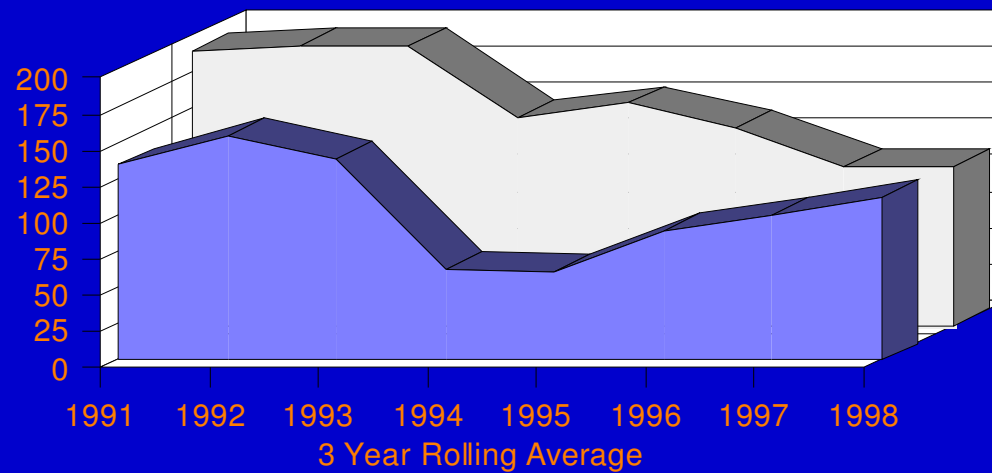
# 1998 EXPOSURE

Department	Budget	Actual
CHEMISTRY	0.750	0.708
CORPORATE	0.005	0.001
CORPS TEAM	0.000	0.002
DECON	5.900	7.299
EMER. PLANNING	0.375	0.060
ENG TECH SUPPORT	5.400	4.819
INFORMATION TECHNOLOGY	0.010	0.141
MAINTENANCE SERVICES	55.000	81.936
MAINTENANCE SUPPORT	0.470	0.659
MOD TEAM	1.050	2.941
NEO ADM/PLANT MGMT	0.005	0.012
NRC/INPO	0.050	0.053
NUCLEAR OVERVIEW	2.500	2.161
NUCLEAR TRAINING	0.770	0.680
OPERATIONS RADWASTE	0.770	1.999
OUTAGE MANAGEMENT	4.980	6.829
PLANT OPERATIONS	6.750	5.610
PROMPT TEAM	2.800	2.555
RADIATION PROTECTION	26.000	18.432
REACTOR ENGINEERING	0.200	0.071
REGULATORY AFFAIRS	0.005	0.008
SAFETY SERVICES	0.100	0.088
SECURITY	0.100	0.102
SMART TEAM 1	3.800	2.633
SMART TEAM 2	15.600	13.584
SMART TEAM 3	1.200	1.786
SYSTEM ENGINEERING	1.800	0.811
VISITORS	0.005	0.033
WAREHOUSE	0.005	0.021
WESTINGHOUSE	79.600	82.616
<b>1998 TOTAL</b>	<b>216.000</b>	<b>238.646</b>

# CURRENT TREND

## Collective Radiation Exposure

Industry PWR Median Values (3 year rolling average)



Industry Median CPSES

# 1999 Radiation Exposure Budget

Department	Unit 2 Outage	Unit 1 Outage	Power Ops.	Total
Chemistry	0.270	0.270	0.390	0.930
Corporate Support	0.010	0.010	0.010	0.030
CORPS Team	0.010	0.010	0.010	0.030
Decontamination	4.500	4.500	1.500	10.500
Emergency Planning	0.100	0.200	0.020	0.320
Eng. Technical Support	9.050	11.900	0.100	21.050
Information Technology	0.100	0.200	0.010	0.310
Maintenance Services	86.000	110.000	4.000	200.000
Maintenance Support	0.300	0.600	0.100	1.000
Modification Team	0.780	2.550	0.100	3.430
Management	0.010	0.010	0.010	0.030
NRC / INPO	0.020	0.030	0.020	0.070
Nuclear Overview	1.950	1.640	0.400	3.990
Nuclear Training	0.800	1.000	0.010	1.810
Operations Radwaste	0.250	0.250	0.960	1.460
Outage Management	0.140	0.290	0.000	0.430
Plant Operations	4.300	4.300	1.600	10.200
PROMPT Team	1.000	1.000	1.000	3.000
Radiation Protection	14.500	14.500	4.000	33.000
Reactor Engineering	0.200	0.200	0.100	0.500
Safety Services	0.060	0.060	0.030	0.150
Security	0.060	0.060	0.030	0.150
SMART Teams	18.070	16.080	2.750	36.900
System Engineering	1.000	1.000	0.300	2.300
Warehouse	0.010	0.020	0.010	0.040
Westinghouse	46.500	55.000	0.000	101.500
<b>Total</b>	<b>189.990</b>	<b>225.680</b>	<b>17.460</b>	<b>433</b>

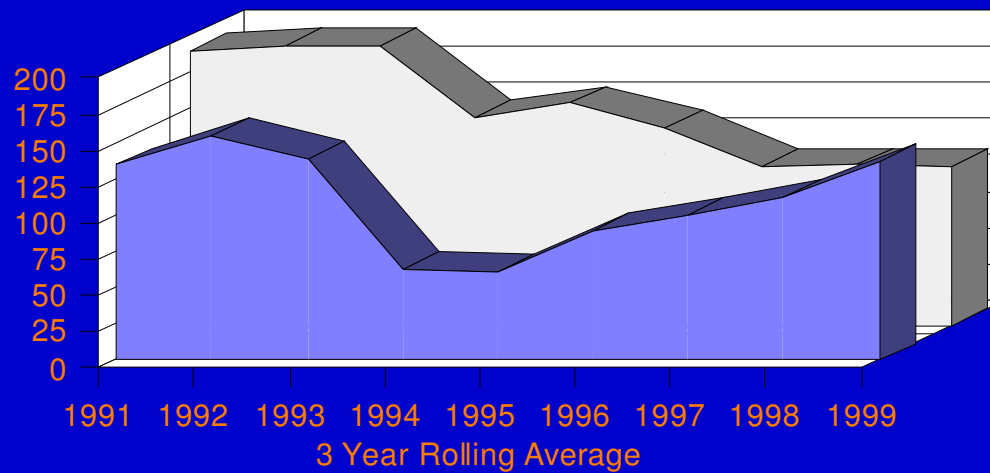
# Refuel, Steam Generator and RCP Work

Department	Unit 2 Outage	Unit 1 Outage	Power Ops.	Total	%
Westinghouse	46.500	55.000	0.000	101.500	100
• Refueling	17	18	0	35	34.5
• S/G Primary	19	25	0	44	43.5
• S/G Secondary	5.5	6	0	11.5	11
• Reactor Coolant Pump	5	6	0	11	11

# PROJECTED 1999 TREND

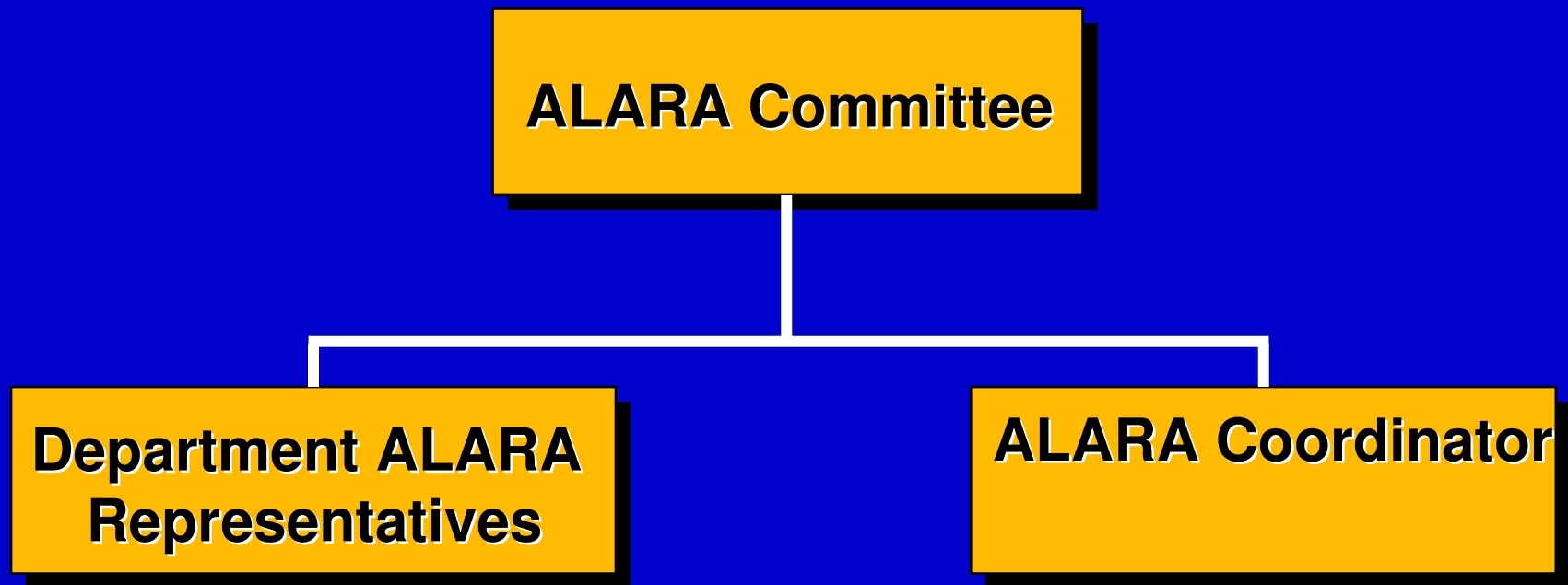
## Collective Radiation Exposure

Industry PWR Median Values (3 year rolling average)



Industry Median CPSES

# Basic ALARA Program Structure



# **SITE-WIDE ALARA PROGRAM**

**ALARA Committee  
SORC (10)  
Senior Management**

**ALARA Coordinator  
Senior Health Physicist  
or RP Supervisor (1)**

**Department  
ALARA  
Representatives (30)**

**ALARA Program  
Health  
Core Team (10)**

# **ALARA PROGRAM HEALTH (Charter)**

- **Objectives**
- **Goals**
- **Develop and Implement Action Plan**

# **OBJECTIVES**

## **(Charter)**

- **Identify ways to reduce exposure**
- **Evaluate and prioritize the identified items**
- **Ensure management commitment and support**
- **Integrate with other applicable programs**
- **Establish goals**
- **Communicate program to site**

# **GOALS**

## **(Charter)**

- **Evaluate past performance and identify activities for key indicators**
- **Identify the issues that require resolution**
- **Identify appropriate personnel for key activities**
- **Benchmark against best performers to establish targets to become best in class**
- **Re-evaluate key indicators to account for target values for key activities.**

# **DEVELOP AND IMPLEMENT ACTION PLANS**

## **(Charter)**

- **Develop the required action plans, ensuring that they will resolve the issues and support site objectives, including human performance issues)**
- **Perform cost benefit analysis, resource analysis, and evaluate outage schedule**

# **ACTION PLAN (cont.)**

- **Evaluate the goals against the action plan schedule and adjust targets as necessary**
- **Assign teams to implement action plans (assign and track action items)**
- **Prioritize Actions based on**
  - **ALARA Benefit**
  - **Cost**
  - **Availability**

# SPECIFIC ACTIONS

- S/G H<sub>2</sub>O Management
- Scaffold Optimization
- Design Modifications
- Permanent Shielding
- Time Management

# **S/G H<sub>2</sub>O MANAGEMENT**

- **Evaluate secondary work to reduce time drained**
- **Plan work in area before of after secondary work**
- **Ensure Outage and Operations support**

# **SCAFFOLD OPTIMIZATION**

- **Unit 1 Steam Generator Primary Side Access Platforms**
- **Pressurizer Compartment Platforms at EL 905'**
- **Permanent Installation of Acoustic Monitoring Instrumentation**

# DESIGN MODIFICATIONS

- **Reactor Head Modifications**
- **Pressurizer compartment platforms**
- **Pressurizer Spray Line shielding**
- **DM for remote Acoustic Monitoring**
- **Permanent lead shielding on NSSS piping**

# PERMANENT SHIELDING



# REPLACE TEMPORARY SHIELDING

- Permanent Lead Shielding on the Lower Segments of the Pressurizer Spray Lines
- Permanent Lead Shielding on non-NSSS Piping

# TIME MANAGEMENT

- **Schedule job to optimize exposure due to plant conditions**
  - **monitor plant conditions during transients (crud burst, etc.)**
- **Alternatives to respiratory protection should be used when appropriate.**
- **Use of respirators should be based on a work duration evaluation (optimization)**

# RESOURCE MANAGEMENT

- **Manpower requirements should be considered with respect to the most efficient number of workers**
- **Use of tool handlers and helpers in adjacent lower dose rate areas**
- **Consider the accumulated exposure of each individual worker**

# MANAGEMENT'S ROLE

- **Critical element for success**
- **Play a proactive role similar to Industrial Safety Program**
- **Management must hold themselves and subordinates accountable for exposure control and reduction activities**

# REGARDING REDUCTION ACTIVITIES

- **LISTEN**

- to the workers

- **COMMUNICATE**

- with the workers

- **SUPPORT**

- the worker's ideas and activities

# **BALANCE (Optimize)**

- **Economic Cost versus Exposure Reduction and Reduced Risk**
- **Do not let any one issue over-ride the consideration of other issues**

# COMMUNICATION

- **Must be open**
- **Occur in all directions**
- **Occur at all levels**
- **Recognized and encouraged**

# ASSESSMENT METHODS

- **Internal Audits**
- **Site Quality Control Inspections**
- **Regulatory Inspection**
- **Peer Review**
- **ALARA Suggestions (feedback)**
- **Internal Reports**

# **REVIEW OF ALARA ORGANIZATION**

- **Department ALARA Representatives**
- **ALARA Program Health Core Team**
- **ALARA Coordinator**
- **ALARA Coordinator**

# CONCLUSION

- Efforts saved over 70 person-rem
- Exposure Reduction is everyone's responsibility
- ALARA Planning facilitates Exposure Reduction
- For the program to be successful . . .  
**MANAGEMENT MUST BE THE SPONSOR**