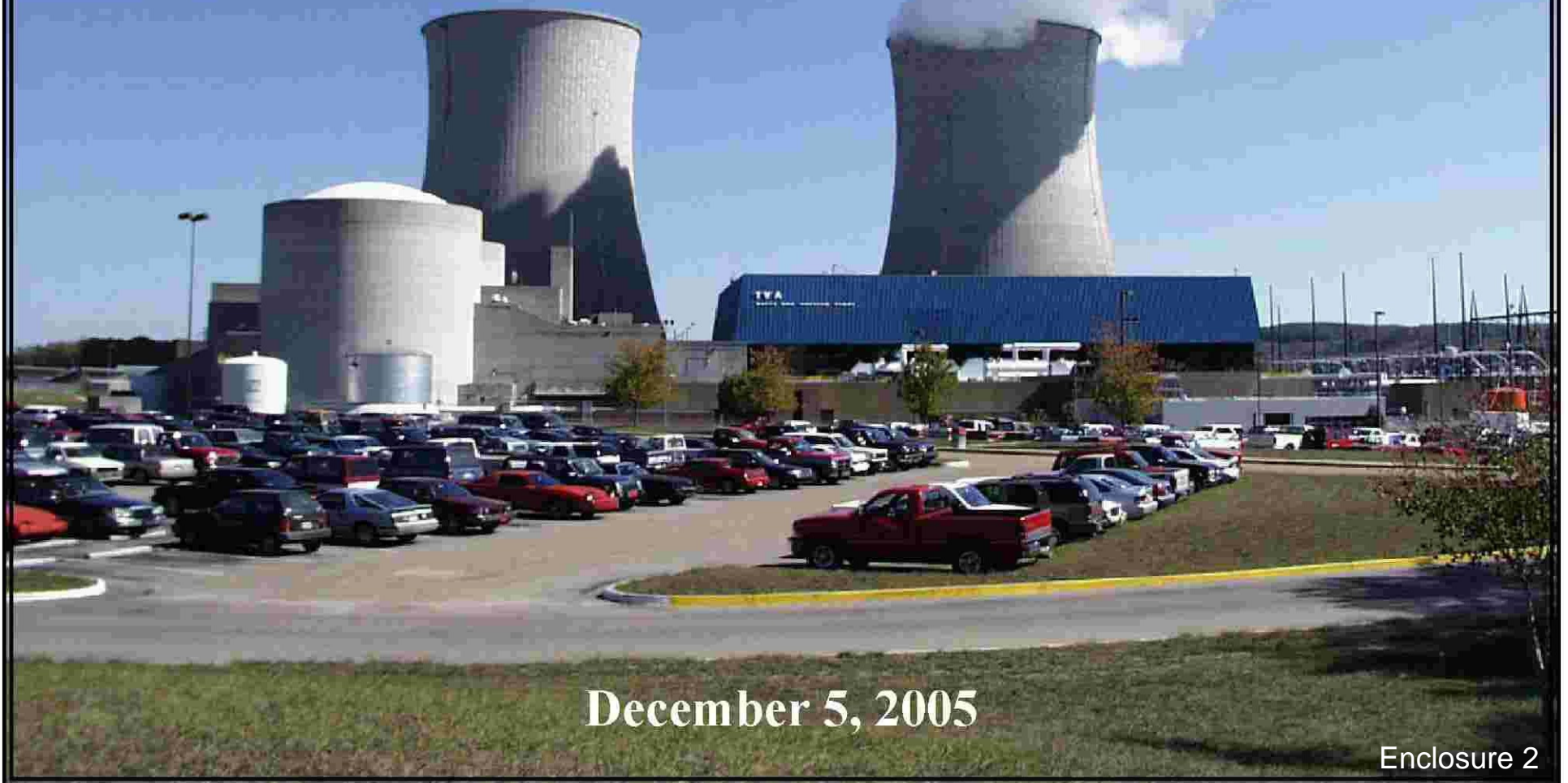


Watts Bar Nuclear Plant

Outage – Human Performance



Agenda



- Introduction M. Skaggs
- Update of Top Ten Plan to Improve Human Performance J. Laughlin
- Outage Human Performance G. Vickery
- Cross-cutting Issue - Human Performance Closure P. Pace
- Closing Remarks M. Skaggs

Human Performance Improvement Plan



1. Streamline human performance processes and error reduction tools to reduce burden.
2. Establish a technique to identify and track non-compliance with rules with an associated disciplinary matrix.
3. Develop revised observation criteria, observation checklists, and observation frequencies needed to monitor compliance with the rules.
4. Determine a set of key administrative processes that warrant additional reinforcement. Establish a means to provide on-the-job reinforcement with follow-up monitoring of knowledge retention.
5. Identify and facilitate resolution of technical procedure inadequacies.
6. Identify and correct conflicting, overly restrictive, or low value administrative rules.
7. Revise the human performance program performance indicators to separate cultural aspects from results.
8. Establish a structured approach to ensure mentoring is occurring between senior station management and first line supervisors in critical positions.
9. Identify and resolve barriers that keep the supervisors out of the field and error precursors that continually challenge workers.
10. Improve the worker and supervisor use and reinforcement of error prevention tools.
11. Raise manager and supervisor levels of accountability for trends in performance within their groups.
12. Establish a standard for recognition of positive performance with reinforcement of that standard.
13. Complete the implementation of the Behavior Based Safety Observation Program.
14. Complete the construction and development of the Dynamic Learning Centers and conduct training for station employees.
15. Communicate recent changes to the industrial safety manual and industry standard performance Indicators.
16. Increase knowledge and awareness of the management and oversight of industrial safety.
17. Establish a Change Management Plan for this initiative.

Supplemental Actions for Sustaining & Continuing Human Performance Improvement



- 1. Implement Human Performance training that incorporates information from BP-253, "Human Performance Program."**
- 2. Upgrade the Dynamic Learning Center (DLC) at each plant. The upgrades will; 1) utilize worker input on what needs to be incorporated, 2) consolidate the dynamic tools used for human performance training, 3) utilize workers as instructors for the DLC training, 4) apply the systematic approach to training for human performance training.**
- 3. Develop an approach to improve focus on procedure use and adherence standards. Consider the incorporation of a procedure use and adherence station in the DLC.**
- 4. Complete observation training for supervisors.**
- 5. Add human performance observations to the behavior based observation program.**
- 6. Develop a Human Performance continuing training plan.**

Human Performance Improvement Plan Results

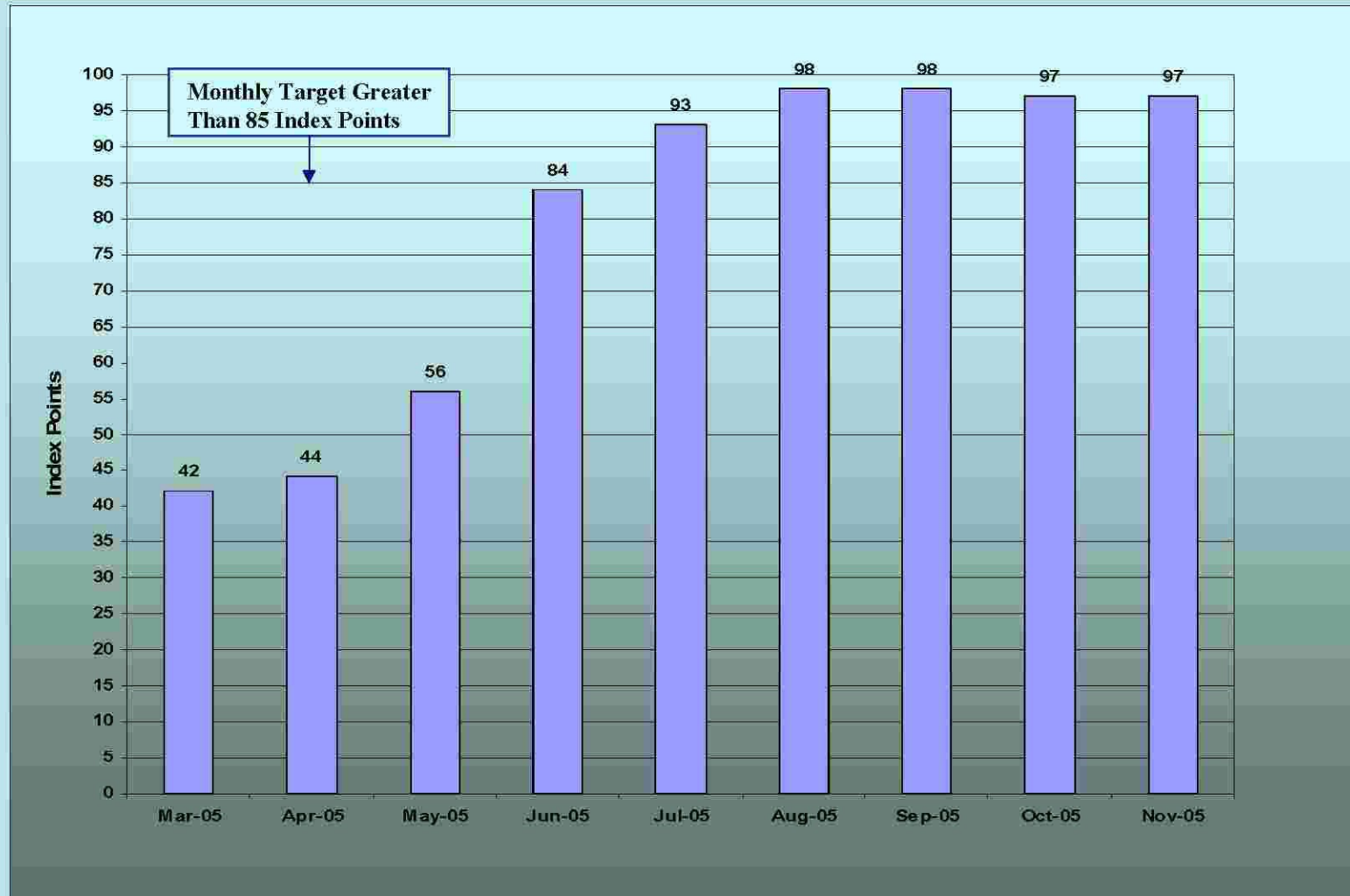


- **Department level Human Performance Clock reset improvements:**
 - Clock reset as of June 2005 - 0 to 3 days.
 - Currently this has improved to 6 to 8 days for the site major organizations.
 - Improvements primarily result from implementation of HP Plan Actions 10 and 11.
 - The key function of the actions was to reinforce the use of error reduction tools.
- **Work Management performance improvement:**
 - Work completion has risen from 85.6% for the twelve weeks prior to U1C6 refueling outage to 92.5% for the most recent twelve weeks (through work week ending November 27).
 - Scope stability has risen from 76.4% for the twelve weeks prior to U1C6 refueling outage to 86.4% for the most recent twelve weeks (through work week ending November 27).
 - Improvements result from the cumulative effect of the implementation of the HP Plan and increased focus on rigorous application of work management processes.
- **Human Performance related events of significance:**
 - No events during Cycle 7 operation (Restart following C6RFO - March 31, 2005).
 - Unit 1 has operated for 248 continuous days on-line.
 - Improvements result from the cumulative effect of the implementation of the HP Plan.
 - The HP Plan actions key to the improvements are Actions 10 and 11.

Human Performance Index – November 2005

No.	Indicator / Measure	Goal for maximum value	Cut-off for minimum value	Points Attainable	WBN Value	WBN Points	Area Owner
Frequency and Quality of Observations				.20 pts			
1	Number of observations per month on Procedure Use and Adherence	>150 observations / month	> 100 observations / month	0.10	178	0.10	Plant Manager
2	Percentage of observations with critical comments	> 90% with critical comments.	> 70% with critical comments.	0.10	97%	0.10	Plant Manager
Identification of Procedure use and Adherence Problems				.20 pts			
3	Number of Procedure Compliance (CP) and Procedure Quality (PD) coded PERs (Precursor Level)	> 8 times more CP and PD coded PERs than the number of department clock resets.	> 4 times more CP and PD coded PERs than the number of department clock resets.	0.20	>8	0.20	Plant Manager
Procedure Improvement and Quality				.25 pts			
4	Maintenance Procedure Backlog Indicators	Average age < 4 weeks.	Average age < 12 weeks	0.05	< 4 wks	0.05	Maintenance
5	Operations Procedure Backlog indicators	Average age < 4 weeks.	Average age < 12 weeks	0.05	9.0	0.02	Operations
6	Radiation Protection Procedure Backlog Indicators	Average age < 4 weeks.	Average age < 12 weeks	0.05	< 4 wks	0.05	RADCON
7	Chemistry Procedure Backlog Indicators	Average age < 4 weeks.	Average age < 12 weeks	0.05	< 4 wks	0.05	Chemistry
8	Engineering Procedure Backlog Indicators	Average age < 4 weeks.	Average age < 12 weeks	0.05	< 4 wks	0.05	Engineering
Knowledge and Skill Improvement				.20 pts.			
9	Number of Observations completed in a Training Setting	>50 observations / month	> 40 observations / month	0.10	88	0.10	Training
10	Percentage of observations with critical comments*	> 90% with critical comments.	> 70% with critical comments.	0.05	93%	0.05	Training
11	Significant Training Program or Knowledge and Skill PERs	No "A" or "B" level PERs > 3 months old	No "A" or "B" level PERs > 6 months old.	0.05	No "A" or "B" PERs	0.05	Training
Equipment Challenges to Human Performance				.15 pts			
12	Operator Work Arounds	Zero P-1 or P-2 with no AUO rounds deficiencies > 12 weeks old	< 3 P-1 or P-2 with no AUO rounds deficiencies > 24 weeks.	0.05	Zero P-1 or P-2	0.05	Operations
13	Maintenance Work Arounds	None > 12 weeks old	None > 24 weeks old	0.05	0 > 12 wks	0.05	Maintenance
14	Rad/Chem Work Arounds	None > 12 weeks old	None > 24 weeks old	0.05	0 > 12 wks	0.05	Chemistry
Total Index Value				1.00		0.97	

Human Performance Index

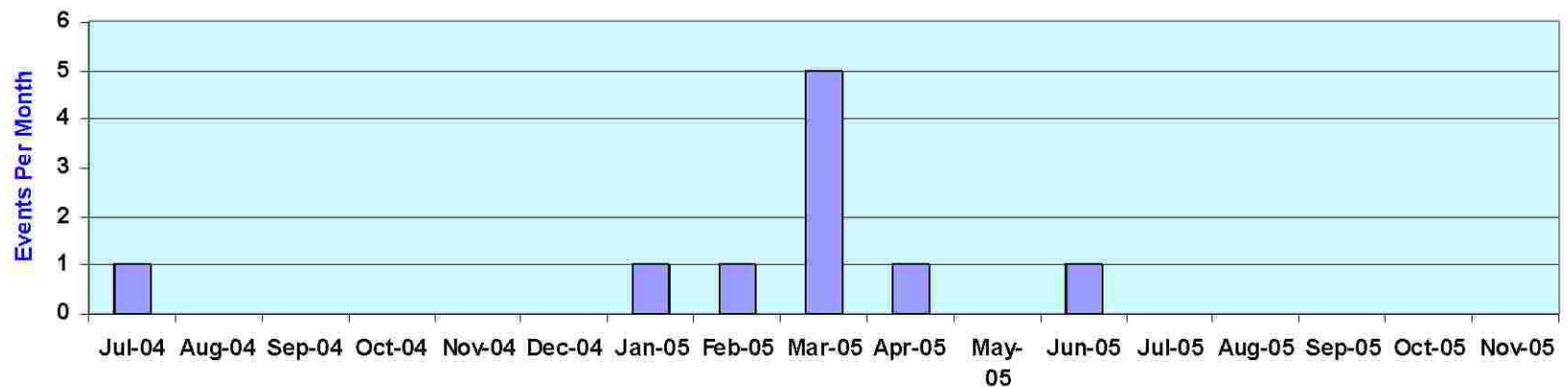


Human Performance Index - a cross-functional measure of specific factors relevant to site human performance.

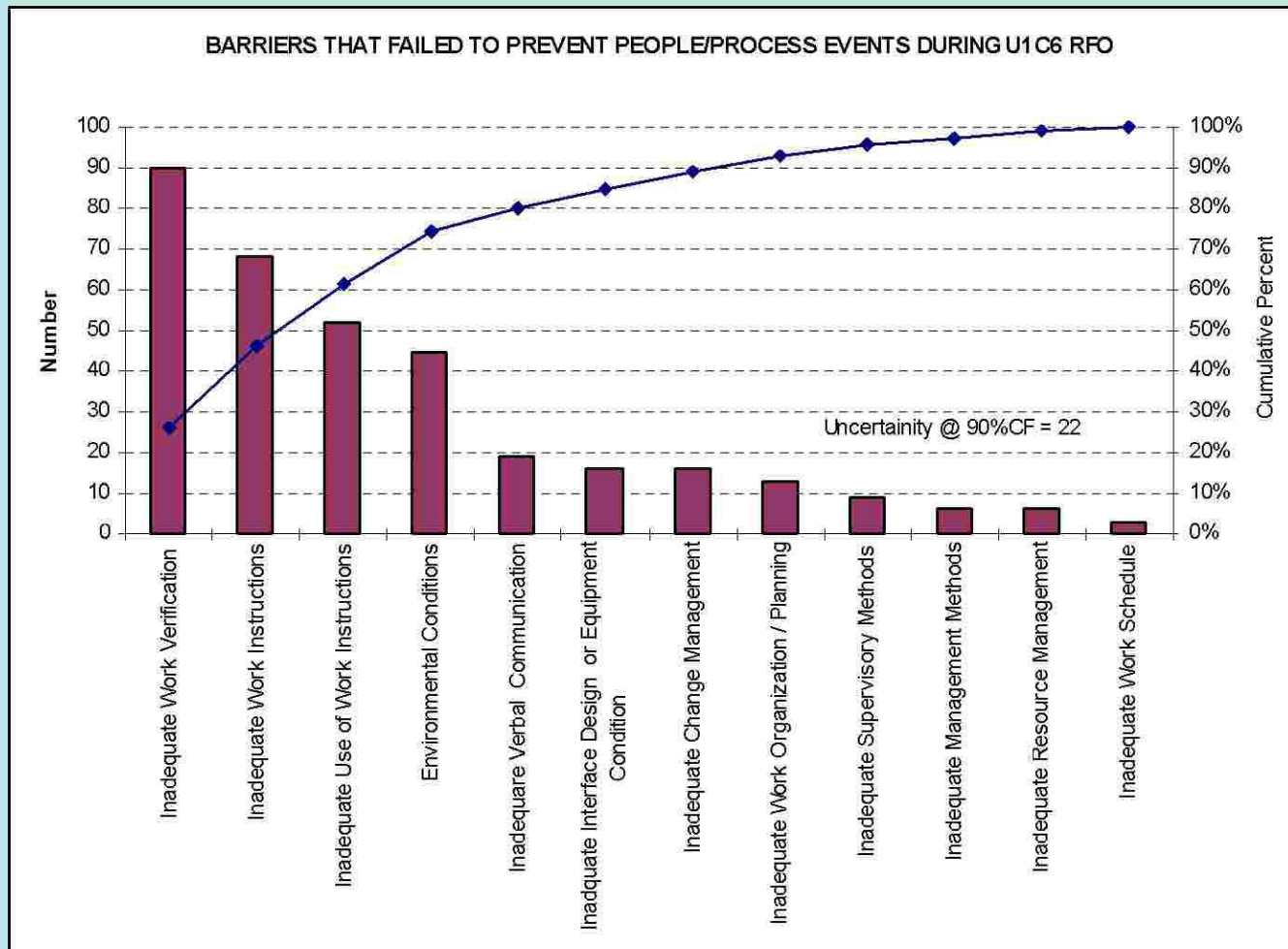
Station Clock Resets



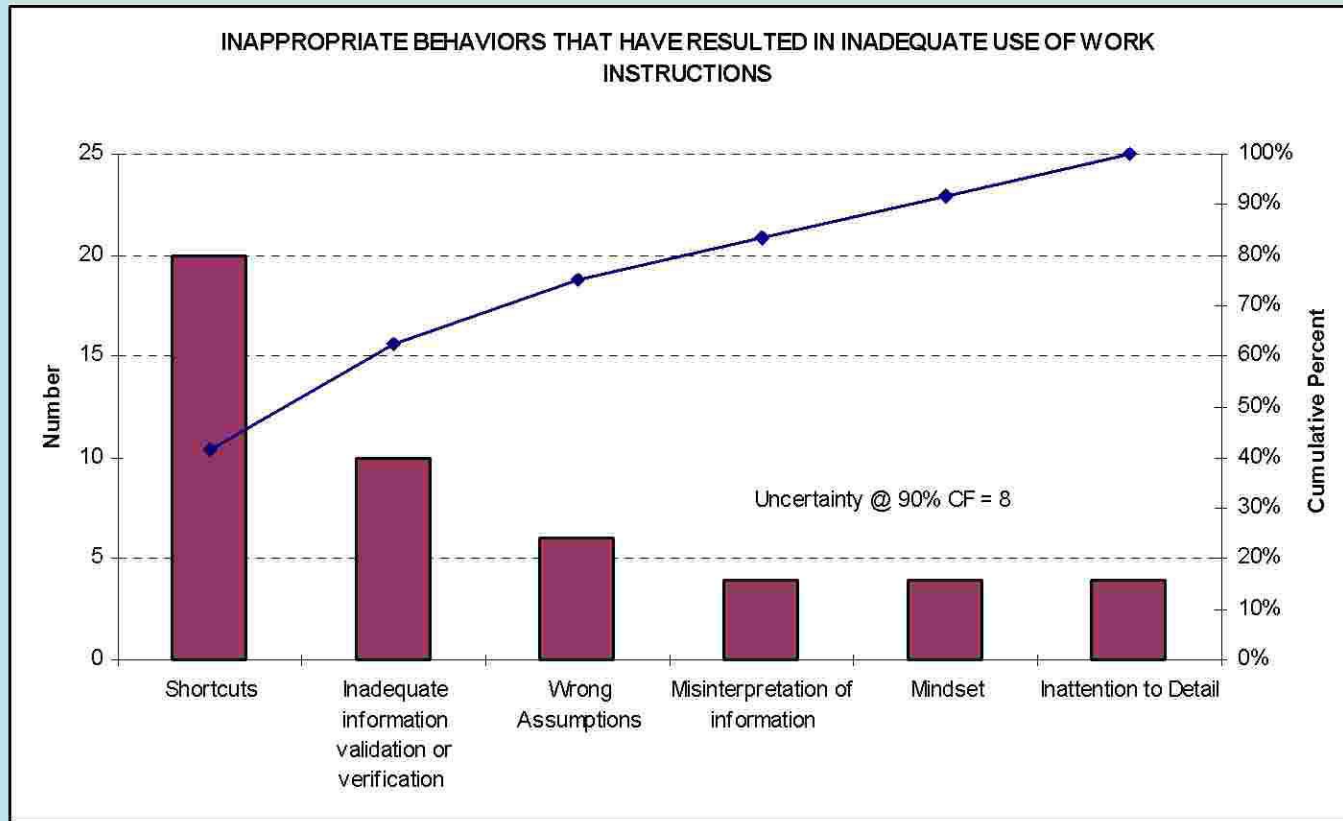
Station Clock Resets (without Industrial Safety or Generation Cost)



Barriers that Failed to Prevent People/Process Events During Cycle 6 Outage



Inappropriate Behaviors that Resulted in Inadequate Use of Work Instructions



WBN Outage Improvement Plan



- Earlier scope development and scope freeze.
- Improved team involvement and commitment to schedule preparation and development by the best individuals in various site organizations.
- Review identified scope to ensure appropriate work is contained within the outage scope.
- Pre-outage Operations Senior Reactor Operator (SRO) review of the schedule for operational risk and shutdown risk issues.
- Review critical paths to ensure adequate details and contingencies are provided within the outage scope.
- Review High Impact Team performance to ensure appropriate standards are being applied and the appropriate approach is being used.
- Review work packages to ensure adequate quality [including Post Maintenance Tests (PMTs)].
- Ensure adequate rigor used in work package walkdowns to provide accurate durations and resource requirements.

WBN Outage Improvement Plan (continued)



- Ensure outage scope alignment with outage resources and outage budget.
- Levelize non-critical path work.
- Develop an outage safety (risk) plan based upon finalized schedule, including detailed reviews by Operations/Engineering and Outage personnel, independent review by TVAN peers and Nuclear Assurance.
- Ensure schedule changes are adequately addressed by the outage safety plan to appropriately manage risk.
- Commit the very best individuals to outage execution.
- Track progress for both critical path and non-critical path work with similar rigor during the outage.

Outage Human Performance Example 1



- **RFO 6 Item - Residual Heat Removal (RHR) pump seal leakage**
PMT not performed at stated conditions:
 - **RFO 7 Actions to Prevent Similar Problems:**
 - Review work packages to ensure adequate quality (including PMTs).
 - Ensure adequate rigor used in work package walkdowns to provide accurate durations and resource requirements.
 - Pre-outage Operations Senior Reactor Operator (SRO) review of the schedule for operational risk and shutdown risk issues.
 - Ensure schedule changes are adequately addressed by the outage safety plan to appropriately manage risk.

Outage Human Performance Example 2



- **RFO 6 Item** - The Cycle 6 Safety Plan did not identify the orange risk condition for electrical power:
 - **RFO 7 Actions to Prevent Similar Problems:**
 - Develop an outage safety (risk) plan based upon finalized schedule, including detailed reviews by Operations/Engineering and Outage personnel, independent review by TVAN peers and Nuclear Assurance.
 - Pre-outage Operations Senior Reactor Operator (SRO) review of the schedule for operational risk and shutdown risk issues.
 - Ensure schedule changes are adequately addressed by the outage safety plan to appropriately manage risk.

Outage Human Performance Example 3



- **RFO 6 Item** - De-tensioning of a Pressurizer Power Operated Relief Valve (PORV) while the Cold Overpressure Mitigation System (COMS) was in service:
 - **RFO 7 Actions to Prevent Similar Problems:**
 - Review work packages to ensure adequate quality (including PMTs).
 - Pre-outage Operations Senior Reactor Operator (SRO) review of the schedule for operational risk and shutdown risk issues.
 - Ensure schedule changes are adequately addressed by the outage safety plan to appropriately manage risk.
 - Track progress for both critical path and non-critical path work with similar rigor during the outage.

Outage Human Performance Example 4



- **RFO 6 Item** - Lifting of a PORV while the Reactor Coolant System (RCS) was water solid:
 - **RFO 7 Actions to Prevent Similar Problems:**
 - Improved team involvement and commitment to schedule preparation and development by the best individuals in various site organizations.
 - Pre-outage Operations Senior Reactor Operator (SRO) review of the schedule for operational risk and shutdown risk issues.
 - Review critical paths to ensure adequate details and contingencies are provided within the outage scope.
 - Charging flow control valves (1-FCV-62-89 and 1-FCV-62-93) performance to be addressed by a design change during the Unit 1 Cycle 7 Refueling Outage.

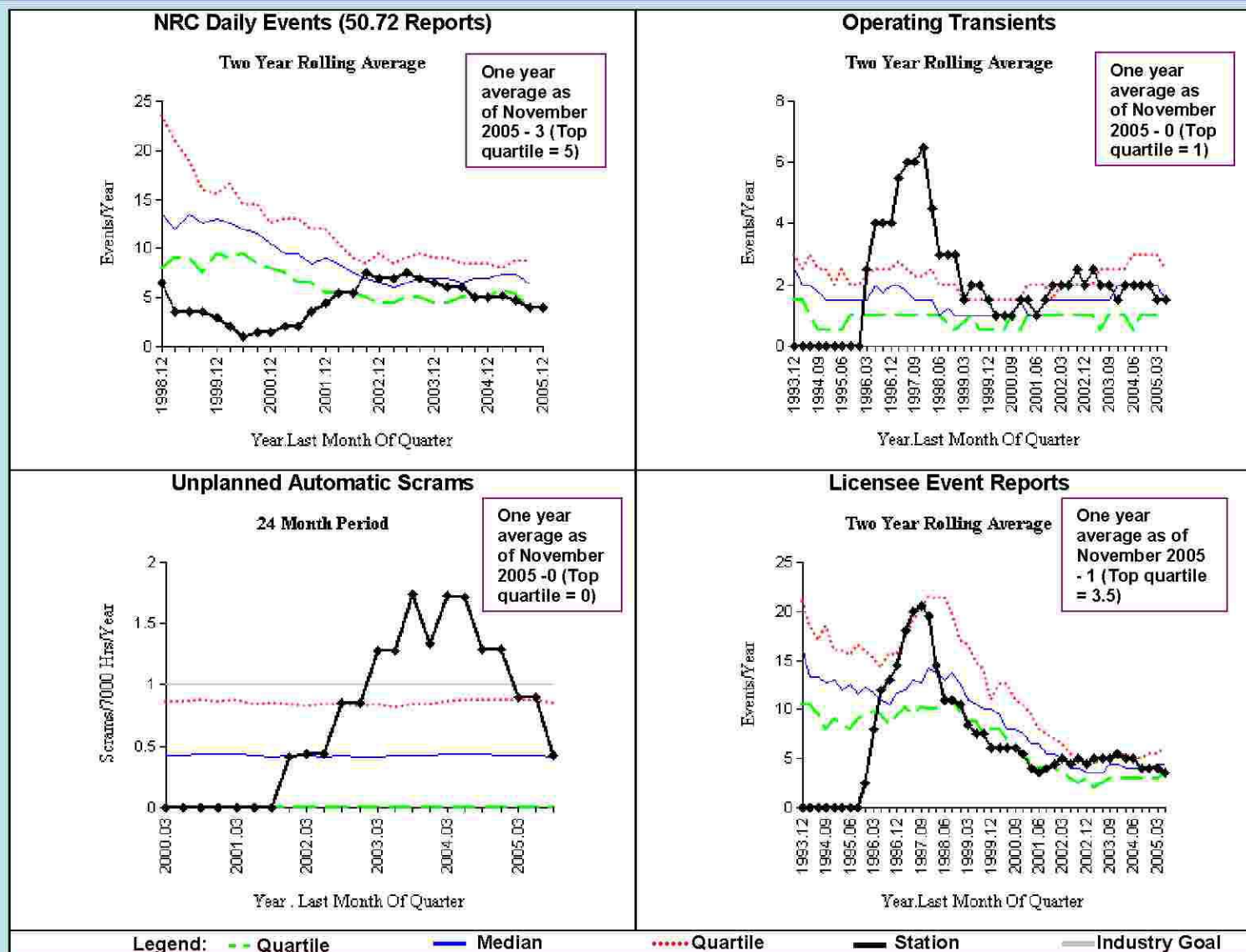
Cross-cutting Issue

Human Performance Closure



- **Inspection Manual Chapter 0305 identifies three conditions for a cross-cutting issue:**
 - Multiple green or safety significant inspection findings in 12-month period.
 - Causal factors have common theme i.e., more than three findings in more than one cornerstone “binned in one area” e.g., personnel.
 - Agency concern for licensee’s scope of efforts or progress in addressing the performance deficiency.
- **TVA performance warrants removal of cross-cutting issue at end of calendar year 2005:**
 - No new NCVs for performance issues that occurred since March 2005.
 - Human performance “Top 10” Plan implemented and supplemental actions well underway.
 - Plant performance indicators show overall improving trend for human performance.
 - Rigorous process in place (critical evolutions review) to minimize risk of human events.
 - WBN improvements have addressed outage performance deficiencies.
 - NRC should have no concerns with TVA’s “scope of efforts or progress.”

WBN & Industry Performance



Summary

