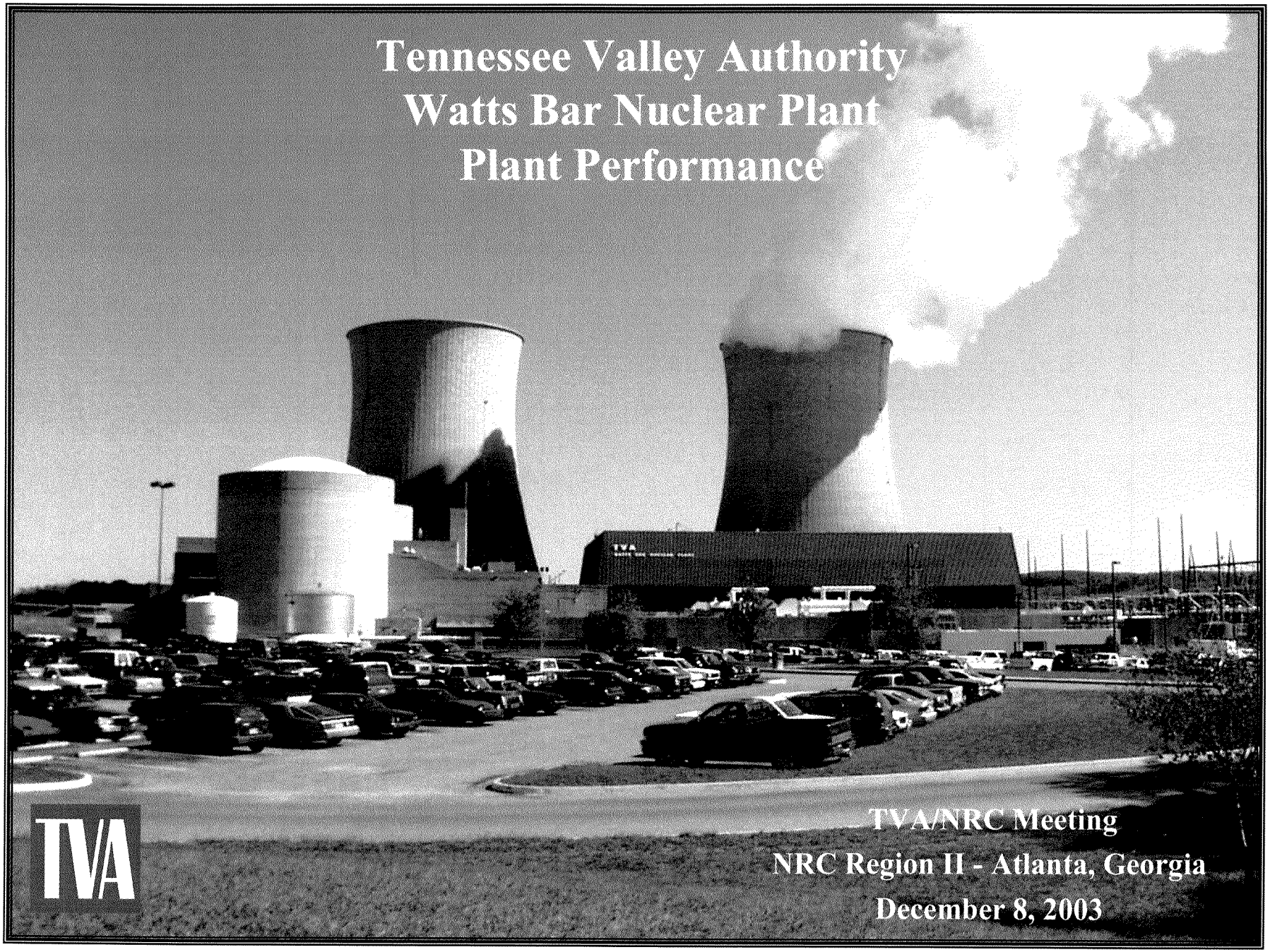

Tennessee Valley Authority
Watts Bar Nuclear Plant
Plant Performance
TVA/NRC Meeting
NRC Region II - Atlanta, Georgia
December 8, 2003
TVA

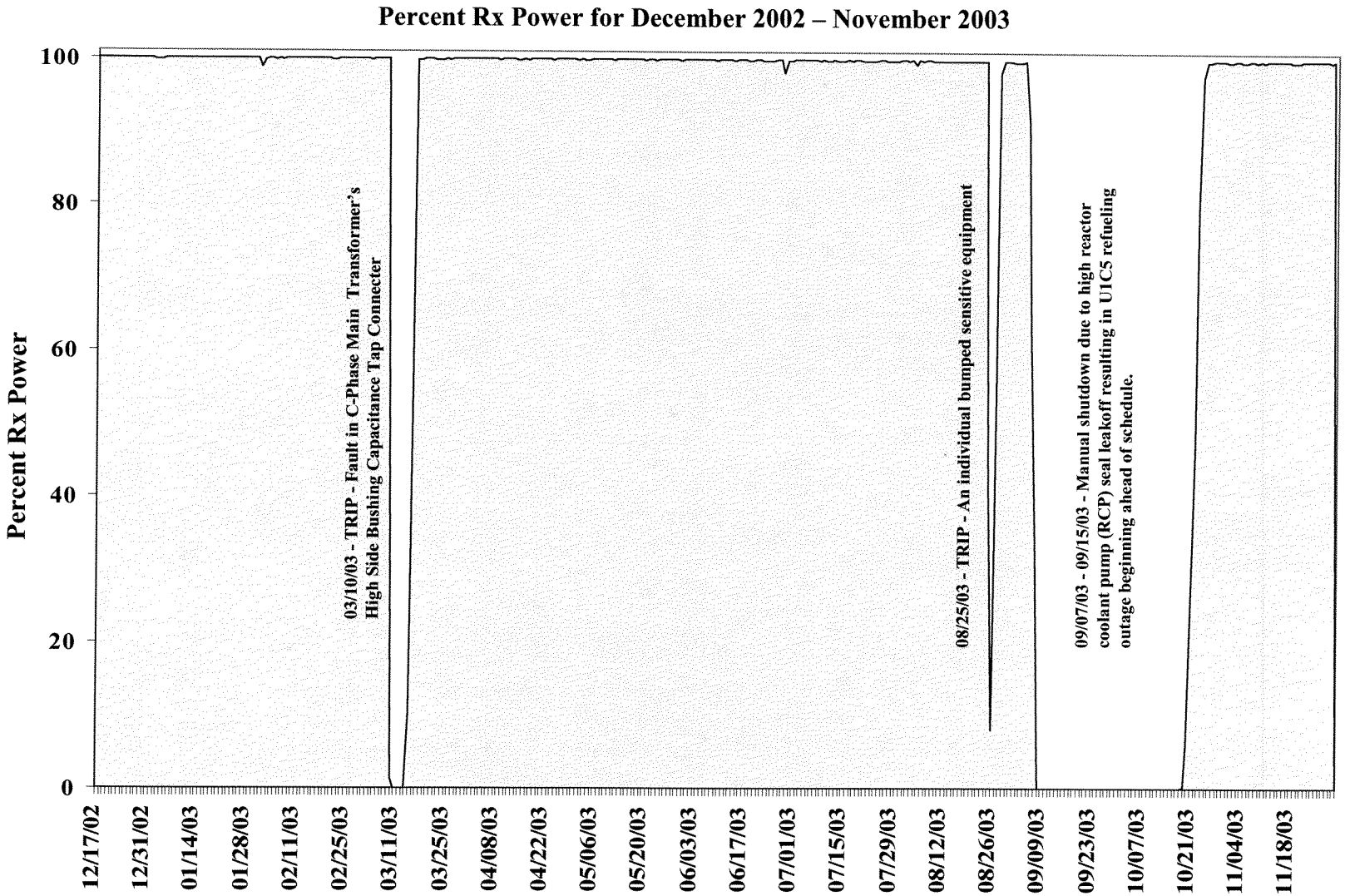
ENCLOSURE 2

Agenda

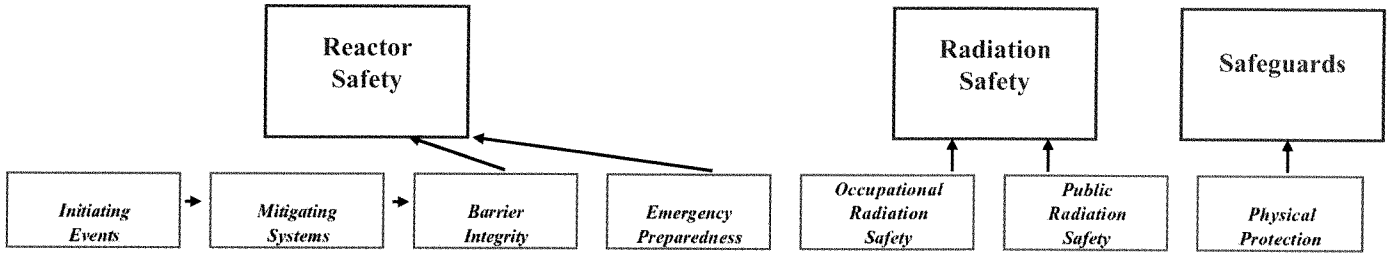
• Introduction	Bill Lagergren
• Plant Performance	Larry Bryant
• Engineering Issues	John Kammeyer
• Refueling Outage Results	Nick Moon
• Site Focus Areas	Jay Laughlin/Tom Wallace/John Kammeyer
• Corrective Action Program	Nick Moon
• Conclusion	Bill Lagergren

Plant Performance

Unit 1 Average Daily Power Level



Performance Indicators



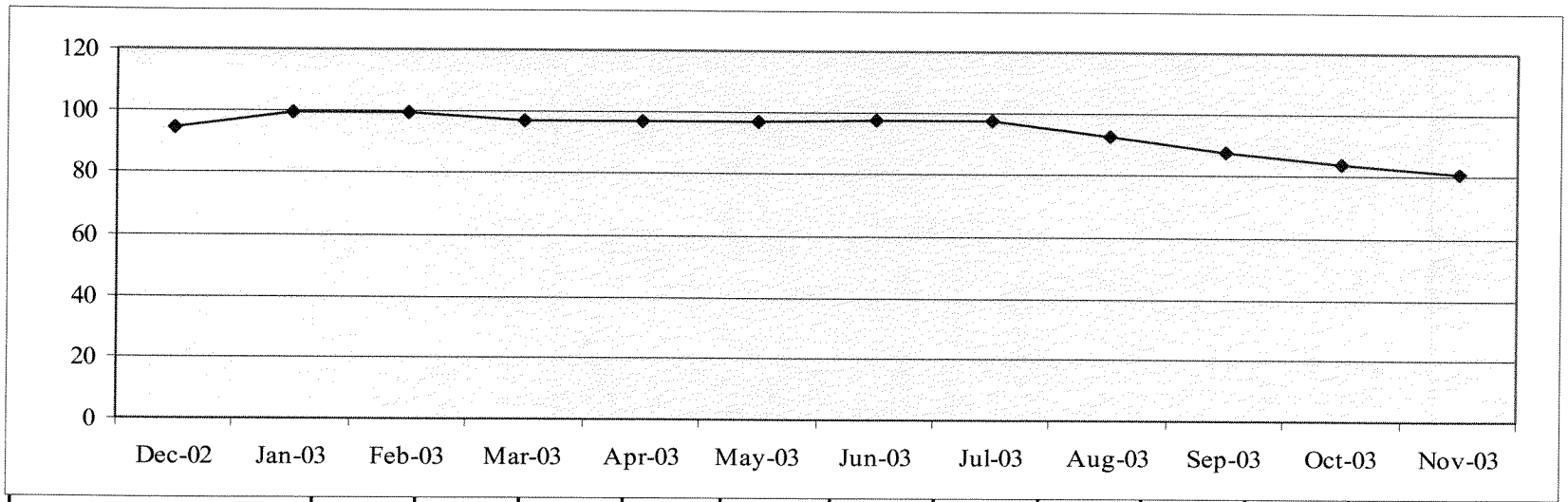
Performance Indicators

Unplanned Scrams (G) 39%	Emergency AC Power System Unavailability 69%	Reactor Coolant System Specific Activity (G) 100%	Drill Exercise Performance (G) 63%	Occupational Exposure Control Effectiveness (G) 100%	RETS/ODCM Radiological Effluent (G) 100%	Protected Area Equipment (G) 95%
Scrams With Loss Of Normal Heat Removal (G) 50%	High Pressure Injection System Unavailability (G) 77%	Reactor Coolant System Leakage (G) 99%	ERO Drill Participation (G) 100%			Personnel Screening Program (G) 100%
Unplanned Power Changes (G) 85%	Heat Removal System Unavailability (G) 80%		Alert and Notification System (G) 86%			FFD/Personnel Reliability Program (G) 100%
	Residual Heat Removal System Unavailability (G) 69%					
	Safety System Functional Failures (G) 100%					

Data as of 10/31/2003

Plant Performance

INPO Performance Index



	Dec-02	Jan-03	Feb-03	Mar-03	Apr-03	May-03	Jun-03	Jul-03	Aug-03	Sep-03	Oct 03	Nov 03
Unit Capability Factor(18mo.)	91.4260	93.2459	93.2076	92.5624	92.5476	92.5612	92.8864	92.8841	93.3102	92.7285	89.0100	90.3744*
Forced Loss Rate(18mo.)	4.2203	2.3324	2.3458	2.2073	2.2120	2.2077	1.8566	1.8578	2.2099	3.8242	2.8141	2.7449*
Unplanned Auto Scrams(24mo@1/03)	1.1471	0.8476	0.8476	1.2714	1.2714	1.2714	1.2691	1.2528	1.6727	1.7266	1.78	1.7766*
High Pressure Injection(36mo.)	0.0020	0.0023	0.0023	0.0022	0.0020	0.0017	0.0018	0.0019	0.0020	0.0020	0.0021	0.0021*
Auxiliary Feedwater(36mo.)	0.0030	0.0030	0.0028	0.0030	0.0038	0.0038	0.0034	0.0031	0.0029	0.0028	0.0079	0.0125*
Emergency AC (36mo.)	0.0067	0.0067	0.0072	0.0080	0.0075	0.0076	0.0098	0.0111	0.0122	0.0122	0.0118	0.0107*
Fuel Reliability(3mo.)	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	5.23E-04	5.23E-04*
Chemistry Index(18mo.)	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.01	1.01
Collective Rad Exposure(18mo.)	66.80	64.87	64.71	65.17	65.15	65.05	64.98	64.80	53.80	84.51	124.22	118.80
Industrial Safety Acc. Rate(18mo.)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00*
INPO Index	94.53	99.34	99.31	96.86	96.85	96.87	97.31	97.47	92.85	87.64	84.17	80.91

* Projected Values

INPO Evaluation Insights

- Overall: 10 Strengths and 1 Area for Improvement
  - Strengths Included
    - Learning Organization
    - Effective operational decision making
    - Positive operations culture – peer coaching
    - Worker alignment with TVAN focus areas
    - Innovative predictive maintenance
    - Design quality
  - Area for Improvement
    - Work control – balancing work priority initiatives with 12 week schedule (self identified)
  - Other Insights
    - Operator crew briefings – balance format/formality with completeness
    - Procedure barriers to prevent human performance errors
    - Chemistry control of closed loop chiller systems
    - Repeat maintenance "warranty period"
    - Some pre-job brief OE not applicable

Engineering Issues

- Reactor Pressure Vessel Head Inspection
  - Cycle 5 Refueling Outage Reactor Vessel Head Inspection
    - Head Found Generally Clean With No Indications of Boron Leakage
    - One Penetration had Boron Deposits on Nozzle OD Surface
      - No Evidence Indicated Penetration Leakage
      - Residue From Canopy Seal Weld Repaired in Cycle 1 Outage
    - UT Inspection of Nozzles at J Groove Welds Planned During RFO6

- Reactor Pressure Vessel Lower Head Inspection
  - Light Surface Rust on Lower Head
  - No Indications of Boron Leakage

- Control Room Habitability
  - Committed to Unfiltered Inleakage Testing Currently Scheduled for Early 2004

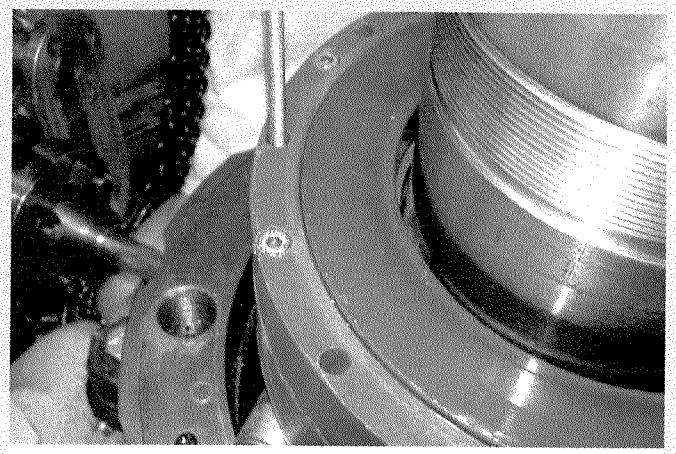
- Emergency Sump Recirculation
  - Cycle 5 Refueling Outage Walkdown for Debris Sources by Vendor
  - Expect RAI to Address Industry Response

ECCS Venting Improvements

- 14 Improvements made
  - 10 New vent locations
  - 4 Pipe extensions
- 392 Feet of piping
- 60 Hangers
- 246 Welds
- Total Manhours: 11,158
  - Craft - 9,953
  - Field Eng - 1,205

RCP Seal Leakoff

- Established root cause team (with PII and W) prior to outage
- Varying degrees of red oxide deposits were found on seal ring and runner faceplates
  - Correlation between the presence of oxide deposits and the degraded performance of RCP 2 and 4 seals.
  - Rust found inside of the Primary Water Storage Tank
  - High dissolved oxygen content in primary water system
- TVA providing results of analysis to WOG RCP seal group
- Immediate Actions Taken Prior to Restart from RFO5
  - Isolation of Primary Water Storage Tank
  - Inline de-oxification equipment installed
  - RCP seal water filter changed from 0.2 to 0.1 microns



RCP 2 Seal – 1 Cycle Only

RCP 4 Seal – 3 Cycles

Refueling Outage - Cycle 5 Accomplishments

- Safety/Reliability Improvements
  - √ Main Steam Isolation Valve Maintenance and Modification Upgrades Implemented
  - √ Vital Inverter modification to connect U1 and U2 boards Implemented
  - √ Replace Bushing on CSST 'D'
  - √ A RHR Pump Seal Replacement
  - √ 1A Charging Pump Seal Replacement
  - √ RCP 1, 2, and 4 Seal Replacement
  - √ Rod Position Indication Modification
  - √ Replaced Main Generator H2 Cooler
- Work Scope
  - Work Orders Planned/Completed: 1102/2369
  - PMs Planned/Completed: 735/790
  - SIs Planned/Completed: 667/825
  - Total DCNs Completed: 63
  - "On-line" WO Backlog Before/After Outage: 606/582

- √ Replaced motor on the Limitorque operator for AFW Trip & Throttle valve with a more reliable motor
- √ Main Transformer Sudden Pressure Relay Modification
- √ Replaced Main Generator CT wiring
- √ Removed Main Turbine Vibration Trip circuitry
- √ Replaced 7 Incore Flux Thimbles due to wear
- √ System 43 (Sampling) Joint Welding
- √ ECCS Venting Modifications

- Steam Generator Outage Results
  - SG Plugging

Steam Generator	RFO5	Cumulative
1	122	171
2	82	139
3	43	91
4	53	151

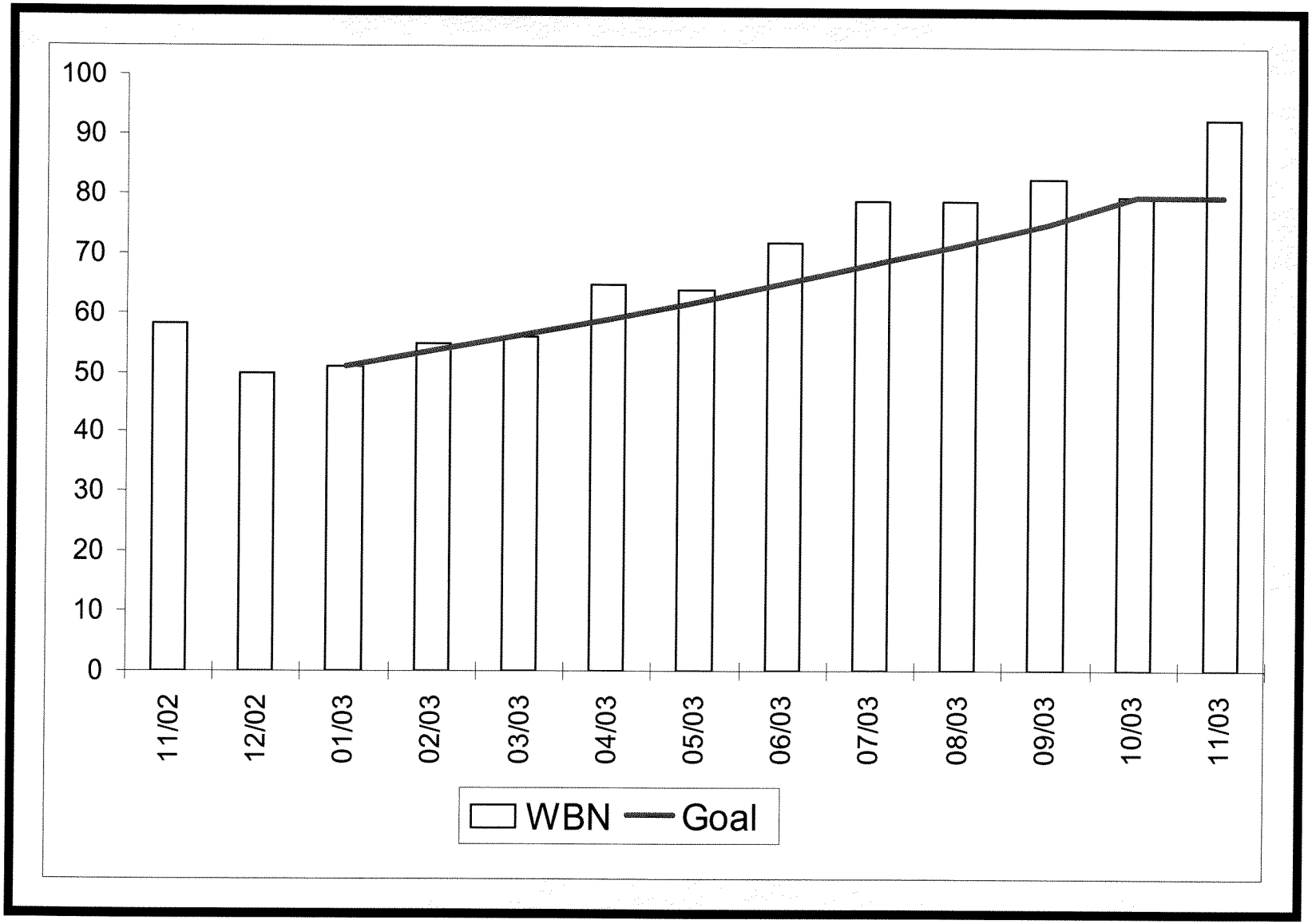
  - Sleeving in SG #4 - 148

Site Focus Areas

- Intolerance for Equipment Deficiencies
- Excellence in Equipment Reliability
- Excellence in Human Performance
- Industrial Safety

Site Focus Areas

Intolerance for Equipment Deficiencies



Site Focus Areas

Intolerance for Equipment Deficiencies

	Indicator / Measure	Goal (maximum value)	Cut-off for minimum value	Index points	Owners	WBN Performance Current	WBN Value	Forecast Date For Full Points
	Operational Challenges							
1	Priority One and Priority Two Operator Work Arounds (non-outage and > 6 weeks old)	Zero	> 1 (WBN)	0.05	S.Smith	0 > 6 weeks old	0.05	Currently receiving full points.
2	CR Panel Deficiencies (non-outage and > 6 weeks old)	Zero	> 6 (WBN) with none > 12 weeks old	0.05	D.Voeller	8 total 0 > 6 weeks old 0 > 12 weeks old	0.05	Currently receiving full points.
3	Fire Protection Impairments that require a fire watch (non-outage)	Zero	> 2 requiring comp measures with none > 6 months old	0.05	T.Davis	0 Requiring Comp Measures 0 > 6 months old	0.05	Currently receiving full points.
4	AUO Rounds Deficiencies (non-outage and > 12 weeks old)	Zero	> 2 (WBN) with none > 1 year old.	0.05	D.Voeller	0 > 12 weeks old 0 > 1 year old	0.05	Currently receiving full points.
5	Unplanned Lit Annunciators (non outage and > 7 days old)	Zero	> 1 per unit with none > 3 weeks old	0.05	D.Voeller	0 total 0 > 7 days old	0.05	Currently receiving full points.
6	Disabled Annunciators - (non-outage and > 12 weeks old)	Zero	> 2 (WBN) with none > 1 year old.	0.05	D.Voeller	0 > 12 weeks old 0 > 1 year old	0.05	Currently receiving full points.
7	Operator Housekeeping and Materiel Condition Observation Results (EIP form 19)	> 20 observations / month	< 12 observations / month	0.05	C.Faulkner	23 Observations	0.05	Currently receiving full points.

Site Focus Areas

Intolerance for Equipment Deficiencies

	Indicator / Measure	Goal (maximum value)	Cut-off for minimum value	Index points	Owners	WBN Performance Current	WBN Value	Forecast Date For Full Points
	Maintenance Backlog and Production *							
8	Elective Work Order Backlog (non-outage, non DCN, plant process equipment) - AP 928 benchmark data	Below the station goal	> 25% above the station goal	0.05	D.Voeller	582	0.03	03/29/04
9	Corrective Maintenance Backlog (non-outage) - AP 928 benchmark data	Below the station goal	> 25% above the station goal	0.05	D.Voeller	8	0.05	Currently receiving full points.
10	Corrective Maintenance Average Age (non-outage) AP 928 benchmark data	Average age less than 3 months	Average greater than 6 months	0.05	D.Voeller	2.22	0.05	Currently receiving full points.
11	Maintenance Production Unit Rates	> 3 jobs / week / craftsman	< 2 jobs / week / craftsman	0.05	D.Voeller	2.61	0.03	1/18/04
12	Deferred Preventative Maintenance Activities	< 2% deferred / month with none past late date	> 10% deferred / month with any past late date	0.05	T. McCollom/ D.Voeller	1.5	0.05	Currently receiving full points.
13	Predictive Maintenance - components in Alert Range non outage	Average age < 6 months	Average age > 12 months	0.05	T. McCollom/ D.Voeller	1.8	0.05	Currently receiving full points.
14	Planning Timeliness (non-outage, non DCN, plant process equipment).	average time to plan package from WO initiation < 35 days	Average time to plan package from WO initiation > 49 days	0.05	T. McCollom	34	0.05	Currently receiving full points.
15	Temporary Leak Repairs - non-outage	None > 3 months	More than one on any unit > 6 months	0.05	D.Voeller	0	0.05	Currently receiving full points.

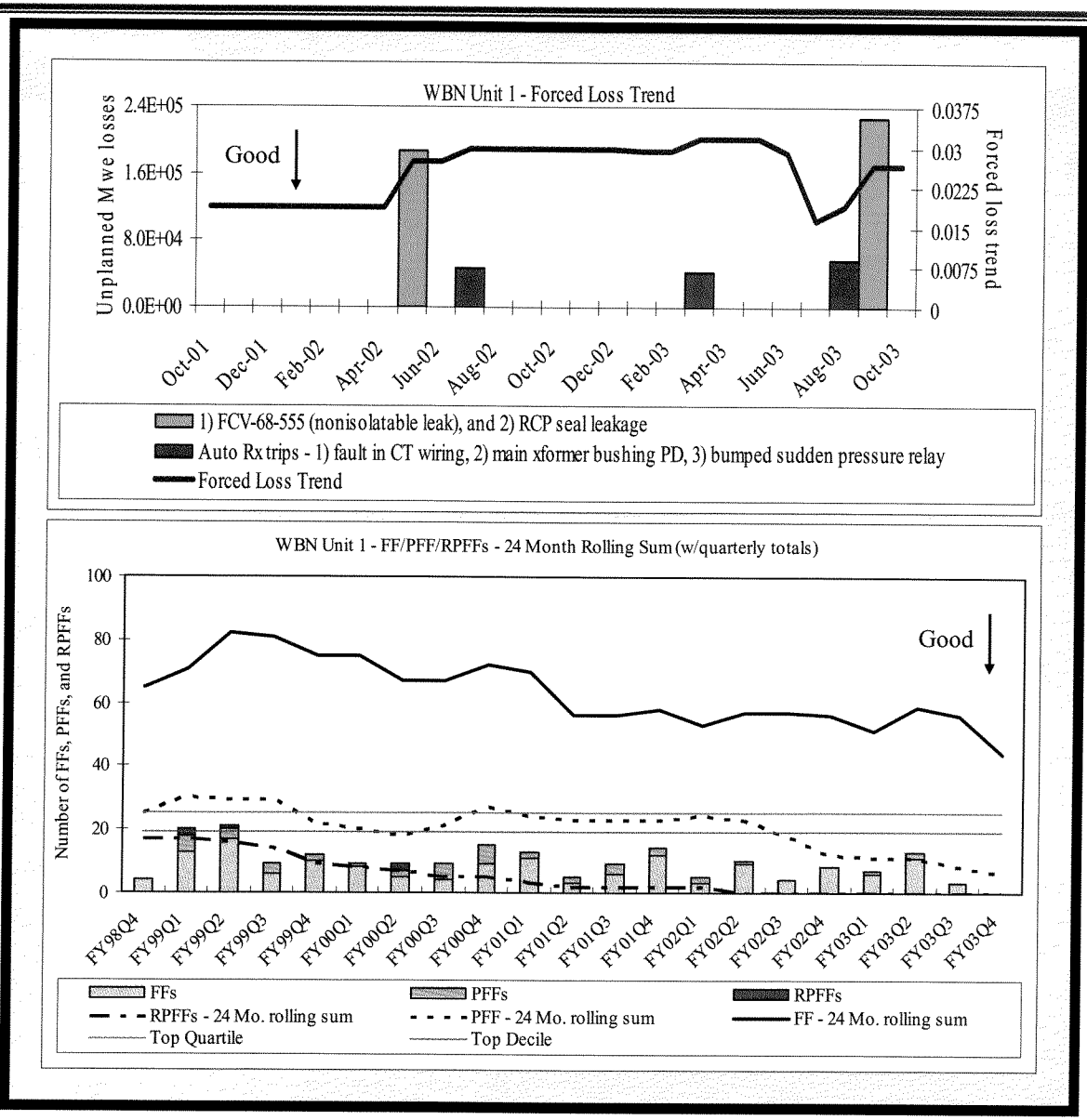
Site Focus Areas

Intolerance for Equipment Deficiencies

	Indicator / Measure	Goal (maximum value)	Cut-off for minimum value	Index points	Owners	WBN Performance Current	WBN Value	Forecast Date For Full Points
	Engineering and Support *							
16	Long-standing red and yellow system health windows (Outage and non-outage)	No windows > 4 quarters old for non-outage related issues, or > 1 cycle old for outage related issues	Three windows > 4 quarters old for non-outage related issues or > 1 cycle old for outage related issues	0.05	B. Briody	0	0.05	Currently receiving full points.
17	91-18 issues average age (non outage)	Average age < 12 weeks with none greater than 9 months	Average age > 6 months or any greater than 9 months	0.05	D. Helms	5 / 0	0.05	Currently receiving full points.
18	Temporary Alterations of Configuration average age (TACF's) - (non outage and > 12 weeks old)	Zero	>3 (BFN, SQN) or >2 (WBN) with none > 1 year old.	0.05	B. Briody	1 / 0	0.03	
19	Number of Significant Equipment PERs (A&B level Equipment PER's)	None > 18 months	Three > 18 months old	0.05	B. Briody	0	0.05	Currently receiving full points.
20	Installation of issued DCN - non-outage and plant equipment reliability related	Average age < 16 weeks old	Average age > 32 weeks old	0.05	M. Brickey	19.2	0.04	Jan-04
	* excluding items "waiting on NRC approval"							
	Overall Tolerance Index	N/A	N/A	1.0			**0.93**	

Site Focus Areas

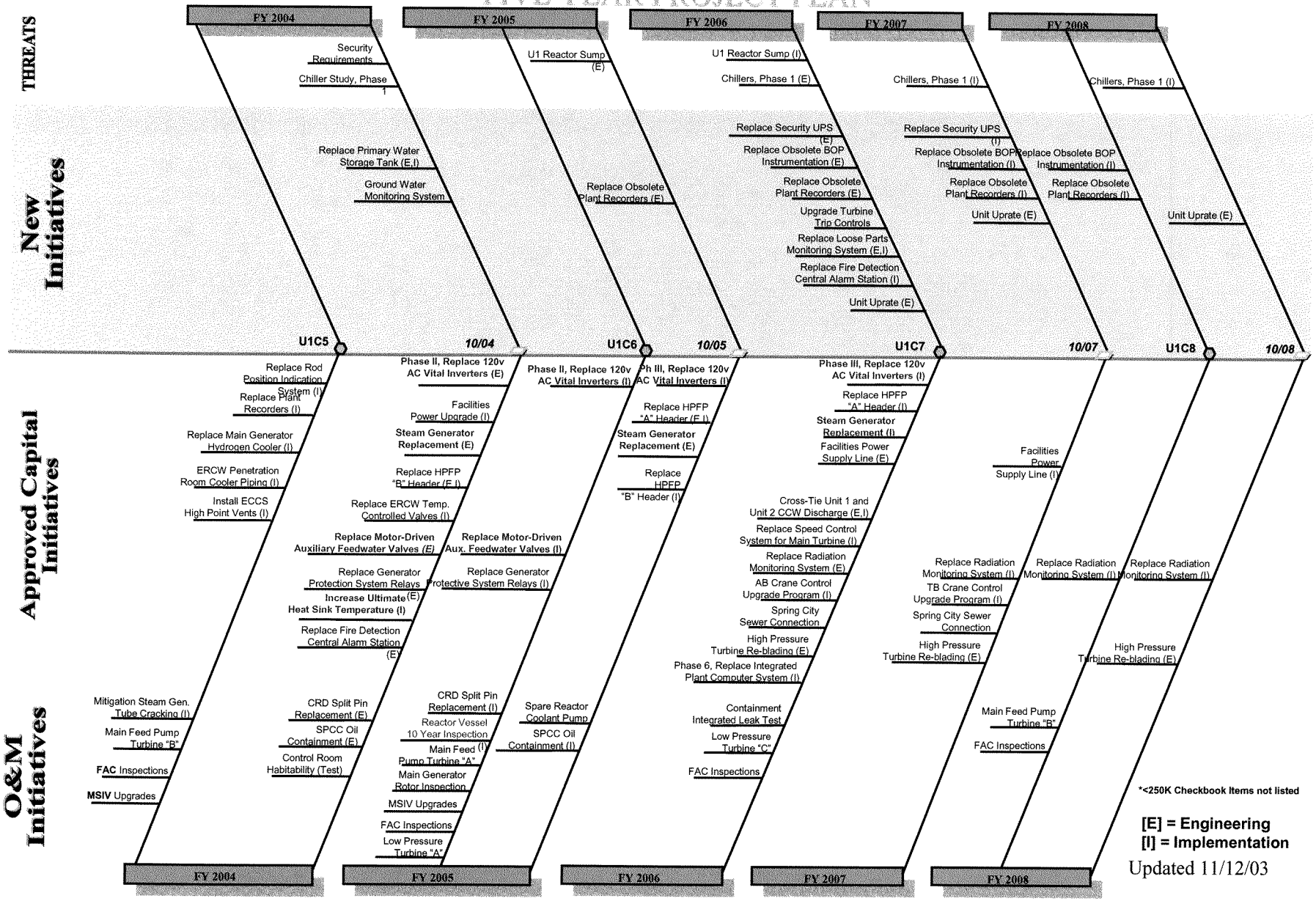
Excellence in Equipment Reliability



John Kammeyer

Watts Bar Nuclear Plant

FIVE YEAR PROJECT PLAN



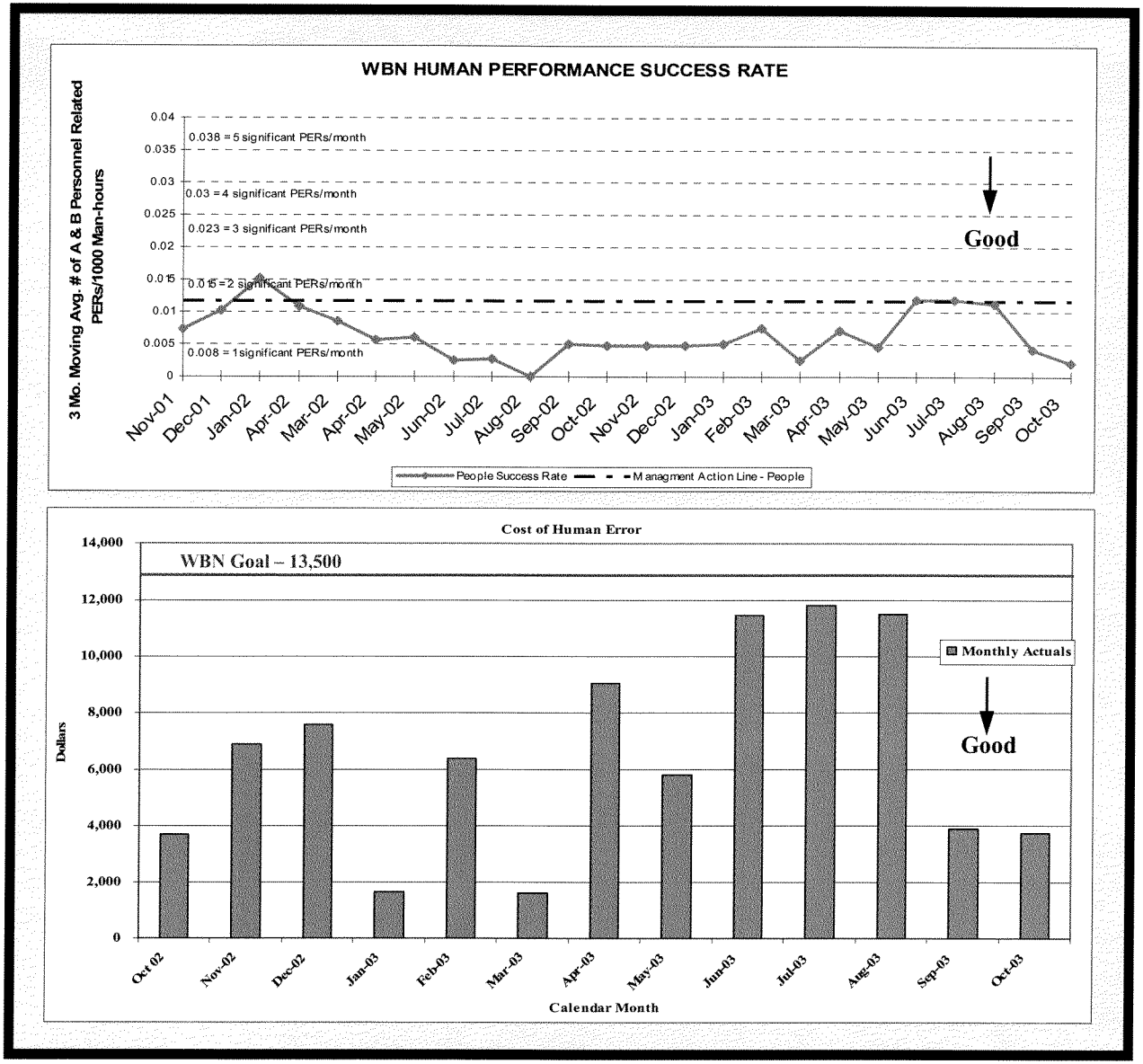
Site Focus Areas

Industrial Safety

	Indicator / Measure	Unit	Goal Value	Threshold Value	Index points	WBN Performance	WBN Value	Owners
	Challenges							
1	Lost time accidents (TVA only)	Current FY Lost Time Injury Rate for lst 12 months	Zero	Zero	0.15	0	0.15	E. Hudgins
2	Recordable Injuries (TVA only)	Current FY Recordable Injury Rate for last 12 months	Less than 50% of TVAN Goal	Less than TVAN Goal (0.55)	0.15	0.48	0.04	E. Hudgins
3	Industrial Safety Near Miss PERs	Near miss industrial safety PERs per month	Zero per month	Less than 3 per month	0.10	0	0.10	E. Hudgins
4	First Aid Rate (TVA only)	Current First Aid Injury Rate for last 12 months	< 4.0	> 5.0	0.15	5.13	0.00	E. Hudgins
5	Interlocking Safety Audits	Percent of selected population performing audits per month	> 95% performing one interlocking audit per month	> 80% performing one interlocking audit per month	0.10	>100%	0.10	L.Bryant
6	Industrial Safety Work Orders – Age	Average age and oldest industrial safety work order	Average age < 12 weeks old with none > 6 months	Average age < 6 months with none > one cycle old.	0.10	6.3 Ave Age 0> 18 mos.	0.00	K. Parker
7	Age of Industrial Safety PERs (not including first aid injury or trend PERs)	Average age of open industrial safety PERs	Average age less than 6 weeks	Average age greater than 6 months	0.10	5.7m	0.03	J. Laughlin
8	Safety Suggestions	Average age of open industrial safety suggestions	Average age less than 6 weeks	Average age greater than 6 months	0.10	17 weeks	0.04	B. Johnson
9	COO Safety Performance Index	completed 18120's with unsafe act and conditions identified	80%	70%	0.05	100%	0.05	T. Wallace
	Overall Tolerance Index				**1.00**		**0.50**	

Site Focus Areas

Excellence in Human Performance



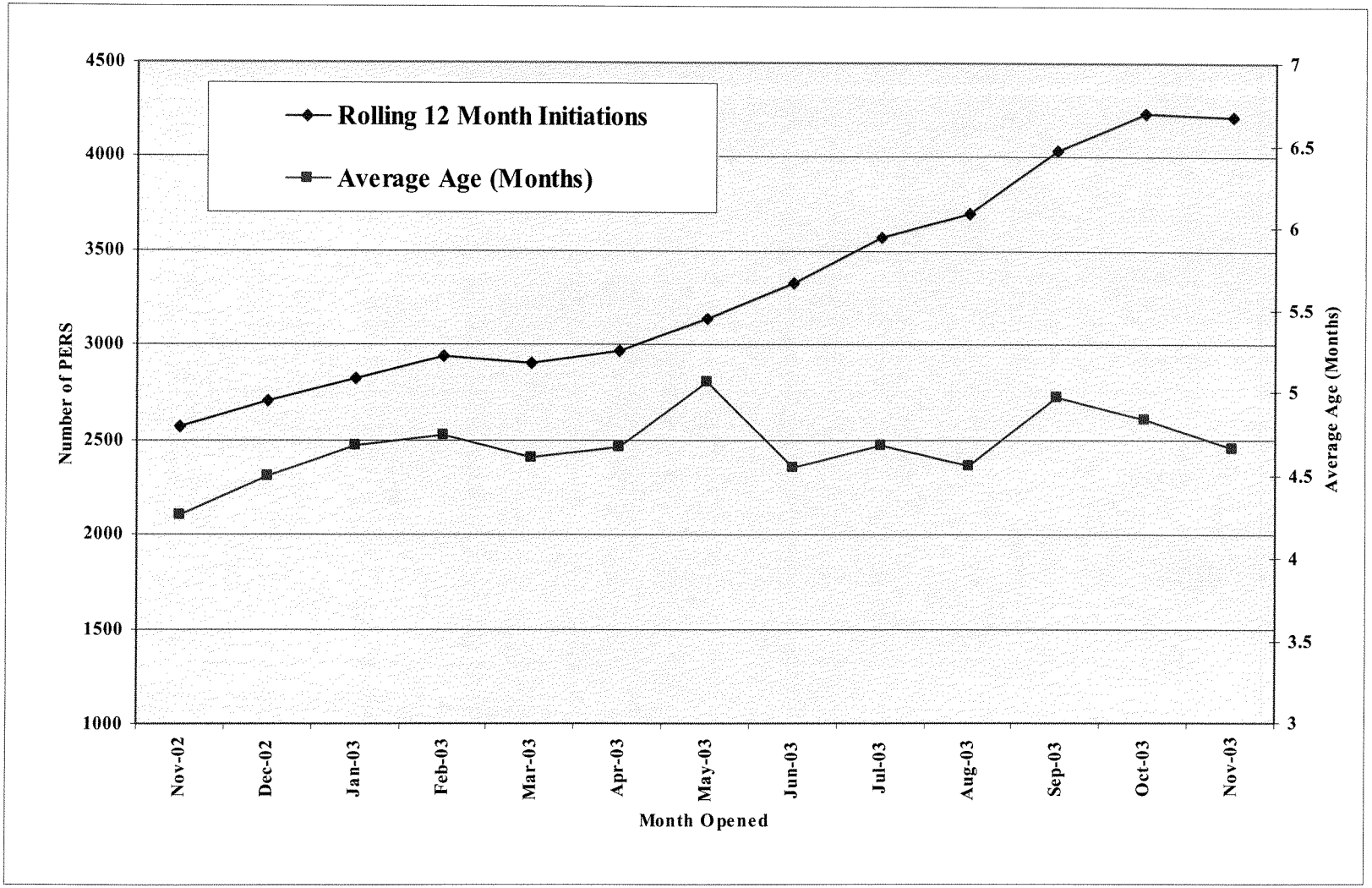
Site Focus Areas

Excellence in Human Performance

	Indicator / Measure	Goal (maximum value)	Cut-off for minimum value	Index Points Attainable	WBN Performance	WBN Value	Owners
	Key Behavioral Focus Area						
1	Pre-Job Briefs observed by management and supervision - from EIP data	all members conduct ≥ one observation per month	< 1/2 members conduct one observation per month	0.15	4.30%	0.00	Laughlin
2	Pre-job Brief success rate - EIP data. (percentage of observed behaviors that met performance standards)	> 95% success rate on meting all performance standards	< 80% success rate on meeting all performance standards	0.15	100.00%	0.15	Laughlin
	Prevention of Errors						
3	Human Performance Tool usage success rate - EIP data. (percentage of observed behaviors that met performance standards)	> 95% success rate on meting all performance standards	< 80% success rate on meeting all performance standards	0.15	99.5%	0.15	Laughlin
4	Human Performance Event Free Clock Resets - (12 month rolling average of events/month)	< 0.2 reset events/month (based on a 12 month rolling average)	> 0.5 reset events/month (based on 12 month rolling average)	0.10	0.75	0.00	Wallace
5	Designation of critical steps in work documents - (EIP observation - Supervisor tools - Work Planning)	> 95% success rate on meeting performance standards	< 80% success rate on meeting performance standards	0.15	100%	0.15	Parker / Wallace
	Defense in Depth Measures						
6	Reinforcement of human performance soft skills in Training Setting	Reinforced in > 95% of training sessions	Reinforced in > 80% of training sessions	0.10	No Data	0.00	Cox
7	Schedule Preparation Milestone Stability @ T-1, less "rapid resolution" work scope.	T-1 schedule prep stability > 90%	T-1 schedule prep stability < 85%	0.05	89.5%	0.04	Welch
8	Emergent Work items added to the T-0 schedule	< 5% emergent work activities added per week	> 10% emergent work activities added per week	0.05	6.5%	0.003	Parker
9	Age of Technical Procedure Backlog*	Average age < 3 months with none > 6 months old	Average age > 6 months	0.10	6.29	0.00	Respective Department Managers
	Overall Tolerance Index			1.00		0.45	

Corrective Action Program

Lowered PER Threshold



WBN Corrective Action Program Changes

- Changes Allow
  - Better focus on correcting immediate problems
  - Improved use of trending to identify recurring problems
  - Less effort on lower level administrative requirements

- Key Changes
  - No change to the process for employees identifying PER conditions
  - PER levels align with Appendix B, Criterion XVI
  - Eliminated the Apparent Cause requirement for level C PERs. (Management may require Apparent Cause for a level C PER)
  - Level C PERs that have an immediate fix (within three days from PER initiation) may be closed without a CAP
  - Level C PER Corrective actions limited to addressing immediate problem
  - Process codes entered by Supervisor
  - Formalized the COG (Cognitive) process for Integrated Quarterly Assessments owned by line organizations

Conclusion