

# *Davis-Besse Nuclear Power Station*



Return to Service Plan Update

August 20, 2002

# Introduction



*Lew Myers*  
*FENOC Chief Operating Officer*

## **Desired Outcomes**

- **Demonstrate the Integrated Schedule of activities is underway**
- **Introduce actions to achieve and ensure sustained Management and Human Performance Excellence**
- **Provide indicators that demonstrate our progress**
- **Demonstrate increased standards by the Quality Oversight organization**
- **Provide status of several Building Blocks**

# Basic Building Blocks

**Return to Service Plan**

**Restart Overview Panel**

**Reactor Head Resolution Plan**  
**Bob Schrauder**

**System Health Assurance Plan**  
**Jim Powers**

**Program Compliance Plan**  
**Jim Powers**

**Restart Action Plan**  
**Low Myers**

**Restart Test Plan**  
**Randy Fast**

**Containment Health Assurance Plan**  
**Randy Fast**

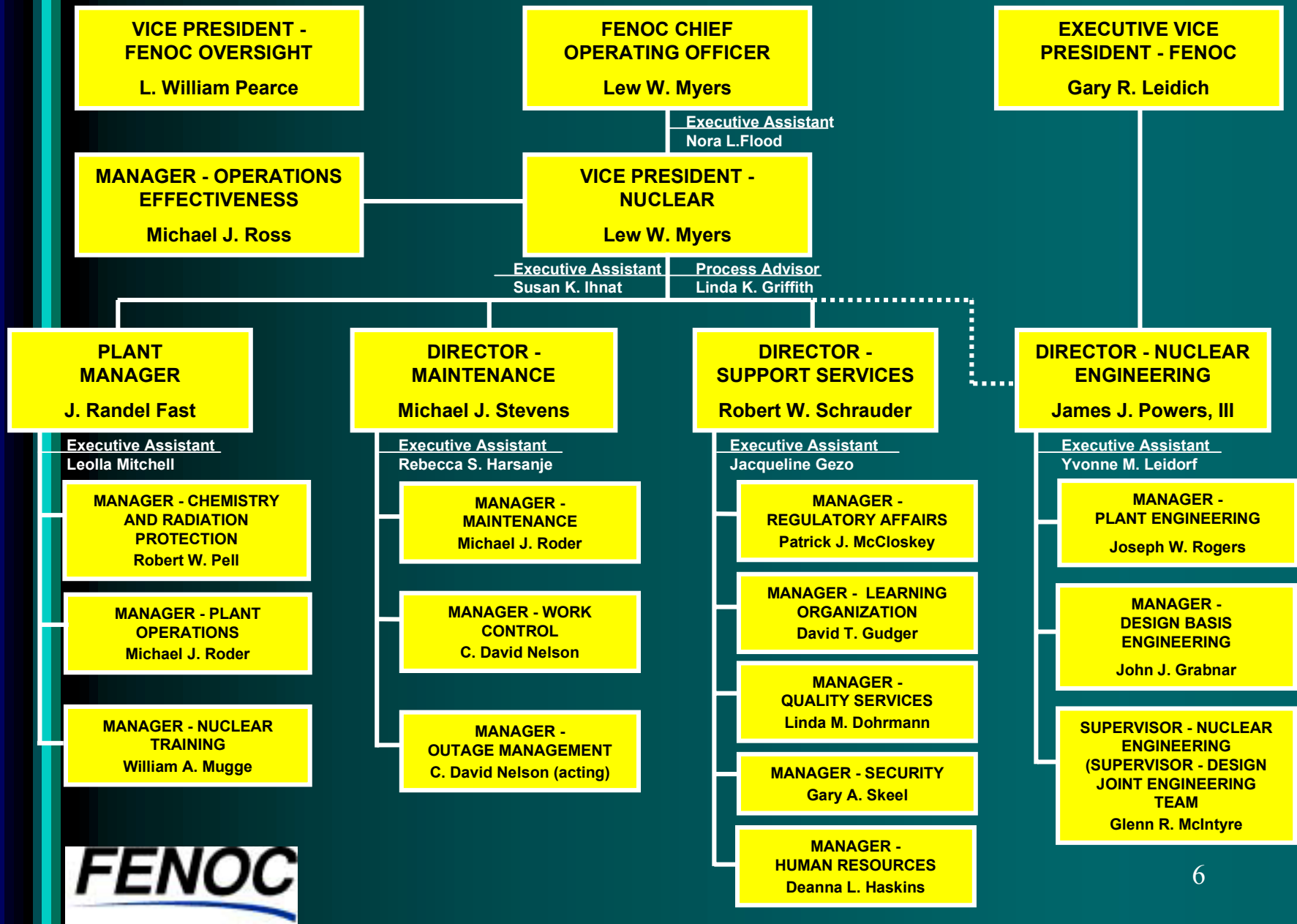
**Management and Human Performance Excellence Plan**  
**Low Myers**

# Management Root Cause Results

## Raising Standards

- **Restart Overview Panel has provided over 80 recommendations**
  - Expand the scope of the Containment Health Assurance Building Block
  - Develop procedures to institutionalize standards and quality
  - Place independent oversight on internal review boards and committees
  - Benchmark specific plants for management practices and standards
  - Strengthen Safety Conscious Work Environment
  - Extend Root Cause to consider fleet-wide implications

# DAVIS-BESSE SITE ORGANIZATION



# Management Root Cause



*Lew Myers*  
*Chief Operating Officer*

# Management Root Cause Results

## Introduction

- Earlier Root Cause investigation and the NRC Augmented Inspection Team report both concluded that management had ineffectively implemented processes, and thus failed to detect and address plant problems as opportunities arose
- The Root Cause Analysis Team was chartered to understand WHY, over a period of time, Davis-Besse personnel failed to identify corrosion of the Reactor Pressure Vessel Head



# Management Root Cause Results

## Root Causes

- **Less than adequate nuclear safety focus**
  - Focus on production, combined with minimum actions to meet regulatory requirements, resulted in the acceptance of degraded conditions
- **Inadequate implementation of the Corrective Action Program**
- **Failure to integrate and apply key industry information and site knowledge/experience; and to compare new information to baseline knowledge**
- **Some steps in the Boric Acid Corrosion Control procedure were not followed**

# Management Root Cause Contributing Causes

## Contributing Causes

- Some decisions were made without considering the need for safety analysis
- Corrective Action Program was not state-of-the-art

# Management Root Cause Corrective Actions

## Extent of Condition

- **Building Blocks designed to find and fix problems**
  - System Health Assurance Plan provides for rigorous system reviews
  - Program Compliance Plan ensures programs meet industry high standards of performance
  - Management and Human Performance Excellence Plan will ensure a strong and sustained safety focus

# **Management Root Cause Nuclear Safety Focus Corrective Actions**

- **New FENOC Executive Team with high standards in place**
- **New Senior Management Team with high standards in place at Davis-Besse**
- **New Management Observation Program**
- **Scheduled observations of plant activities**
- **Case study training and re-baselining of standards**
- **Reinforce Safety Conscious Work Environment**

# **Management Root Cause**

## **Nuclear Safety Focus Corrective Actions**

- **Staffed Organizational Effectiveness Experts**
- **Four C's Employee Meetings**
  - Compliments
  - Communications
  - Concerns
  - Changes
- **Ownership for Excellence Review of all Managers and Directors**
- **Competency Assessment of all Key Supervisors**

# **Management Root Cause**

## **Corrective Action Program Corrective Actions**

- **Latent Issues Review by outside expert in progress**
- **Criteria for categorizations is now effectively implemented**
- **Existing, long-standing conditions are being reviewed as SCAQs**
- **Corrective Action Review Board has been strengthened**

# Management Root Cause

## Corrective Action Program Corrective Actions

- Routinely perform assessments of categorization
- Repeat conditions are to be evaluated as SCAQ
- Require the use of formal cause determination techniques for root and basic cause evaluations to ensure analytical rigor is applied
- Define and implement training for cause evaluations
- Improve guidance on reviews of the effectiveness of corrective actions
- Implement an effective site-wide equipment trending program

# **Management Root Cause Technical Rigor Corrective Actions**

- **Established FENOC hierarchy of documents for consistent standards for analysis of safety issues**
- **Established Engineering Assessment Board to reinforce standards**
- **Established a periodic system walkdown program**
- **Established a periodic Engineering Program Review process**
- **Re-baseline standards and expectations in each FENOC group**



# **Management Root Cause Procedure Compliance Corrective Actions**

- **Established training to applicable Boric Acid inspectors**
- **Reinforce standards and expectations for procedure compliance and the need for work-practice rigor**

# **Management Root Cause Procedure Compliance Corrective Actions**

- **Implement Management Observation Program with weekly schedules (used at Beaver Valley and Perry)**
- **Perform independent assessments of procedure compliance**
- **Discuss procedure compliance regularly at morning meeting**

# **Management Root Cause Contributing Causes Corrective Actions**

- **Establish the FENOC decision-making process at Davis-Besse, including hazard analysis**
- **Perform corrective action procedure benchmarking**

# Management Root Cause Corrective Actions

## Other Relevant Improvements

- Realign Incentive Program to increase Focus on Safety
- Establish policies to support safety
  - Operations involvement
  - Management presence in the field

# **Management Root Cause Summary**

**FirstEnergy's CEO has set the standard of returning Davis-Besse to service in a safe and reliable manner, and doing the job right the first time.**

**We are committed to meeting this challenge.**

# Restart Progress



***Clark Price***  
***Manager -- Business Services***

# **Restart Progress**

**Our focus is to ensure the plant and our people are meeting new high standards for restart and sustained, safe operations.**

# Restart Progress

## Restart Action Milestones

- System Walkdowns complete
- Containment Inspections near complete
- Containment Shield Building cutting complete
- Containment painting preparations underway
- Containment Polar Crane modification complete this week
- Containment Air Cooler Coil removal complete
- Management Root Cause report complete



# Restart Progress

## System Walkdown Overview

- Approximately 80 separate walkdowns conducted
- 31 System Health Readiness Review Systems
- 5 Latent Issue Review Systems
- Configuration Verification walkdowns for selected systems will occur later
- > 3,500 manhours were expended
  - Members of all 36 System Readiness and Latent Issues Walkdown Teams
  - Management Oversight participation

# Reactor Coolant System



# Containment Air Cooler



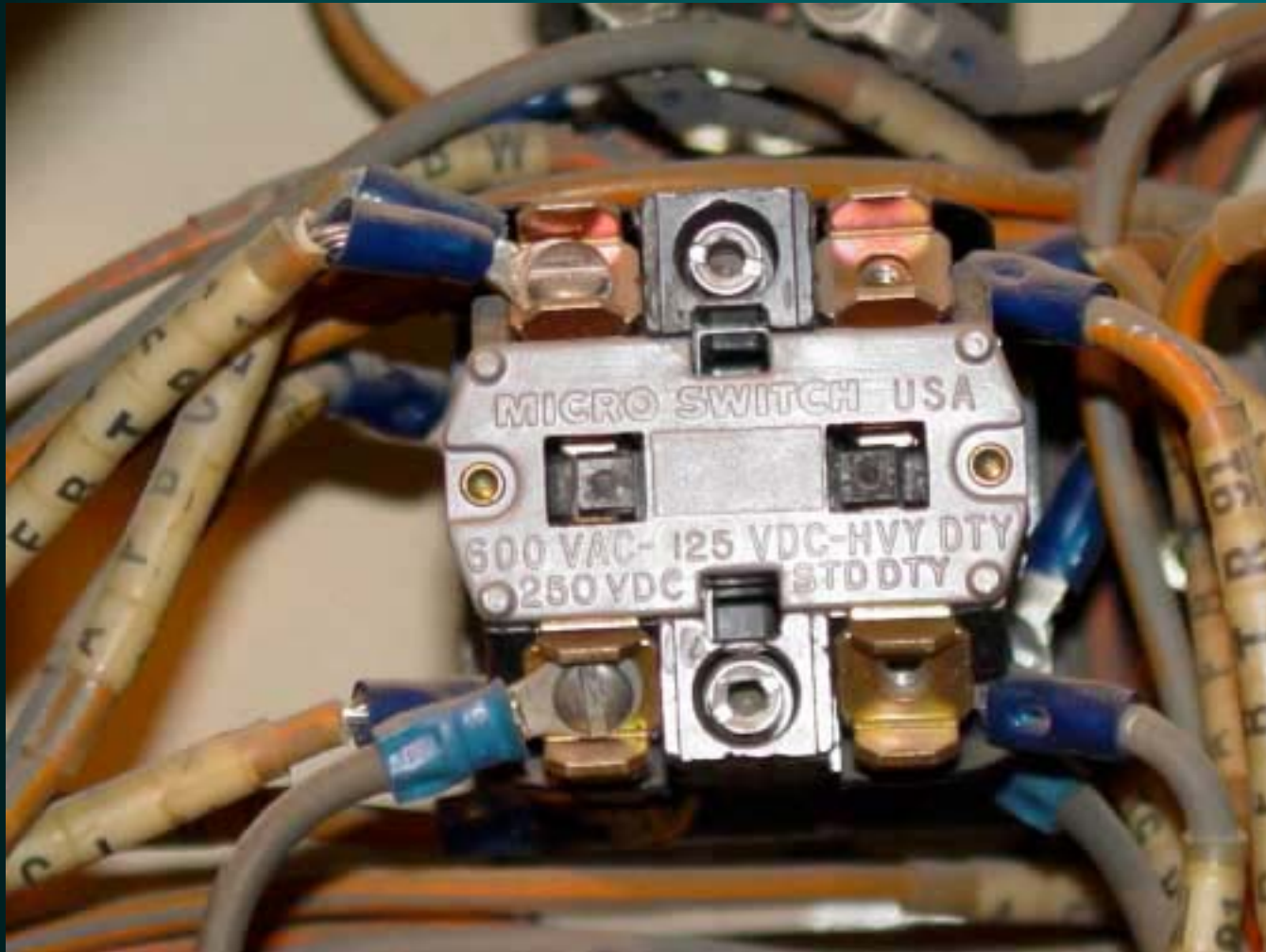
# Management Oversight Participation



# Examples of Containment Debris



# Safety Features Actuation System Cabinet Wiring



# 125Volt DC Power Panel Connection



# Restart Progress

## System Walkdowns - Generic Issues

- Numerous small valve leaks
- Need to improve cleanliness and proper housekeeping in less-accessed areas
- Thread Engagement - packing followers, valve studs, etc.
- Loose conduit and tubing
- Crushed tubing/bent sensing lines



# Restart Progress

## System Walkdowns - Significant Findings

- Substantial debris in Containment
- Substantial dust in Control Room panels
- Pressurizer manway stud thread engagement
- Potential MOV lubrication degradation
- SFAS Control Room cabinets contain multiple examples of poor workmanship that may challenge long-term functionality
- Potential non-compliance with EQ requirements for MOVs (electrical terminations, t-drains, etc.)

# Restart Progress

## System Walkdowns - Significant Findings

- EDG HVAC Exhaust Hydramotor damper arm loose
- EDG Exhaust Silencer Tornado Missile Shield structural attachment to roof parapet degraded
- Over 200 CRs initiated to-date
- More CRs are being written to complete the walkdown findings

# Restart Progress

## System Walkdowns - Cumulative Impact

- Status of systems to support safe and reliable operation is being evaluated
- Number of valve packing leaks may require substantial effort to fix prior to restart
- Lack of proper thread engagement issue requires broader investigation
- Investigation to Extent of Condition of potential EQ issues may lead to additional work

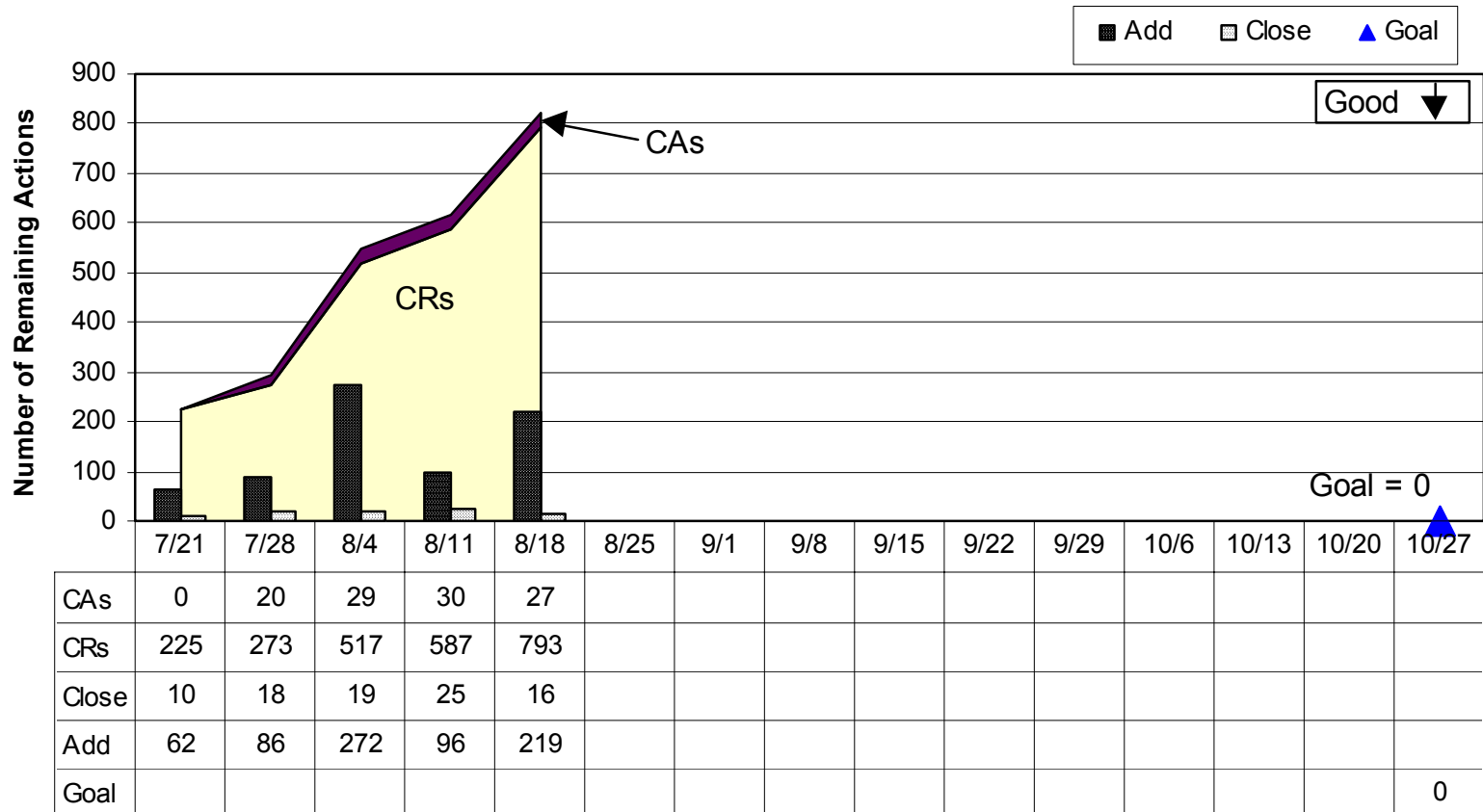
# Restart Progress

## Measuring Progress

- **Established Indicators to track:**
  - Progress on Building Block Plans
  - Progress on NRC Inspection Manual Chapter 0350 Restart Checklist
  - Progress towards meeting new standards for restart and sustained operational excellence

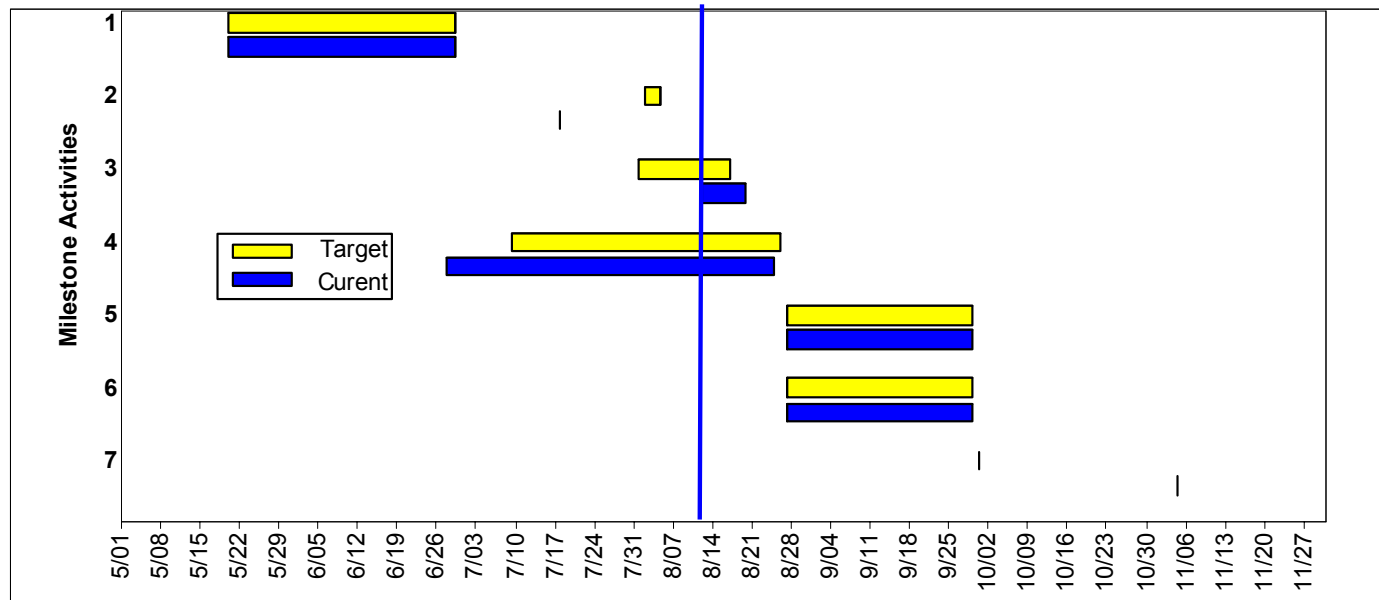
# Restart Progress

## RESTART ACTIONS



# Restart Progress

## REACTOR VESSEL HEAD REPLACEMENT PROJECT

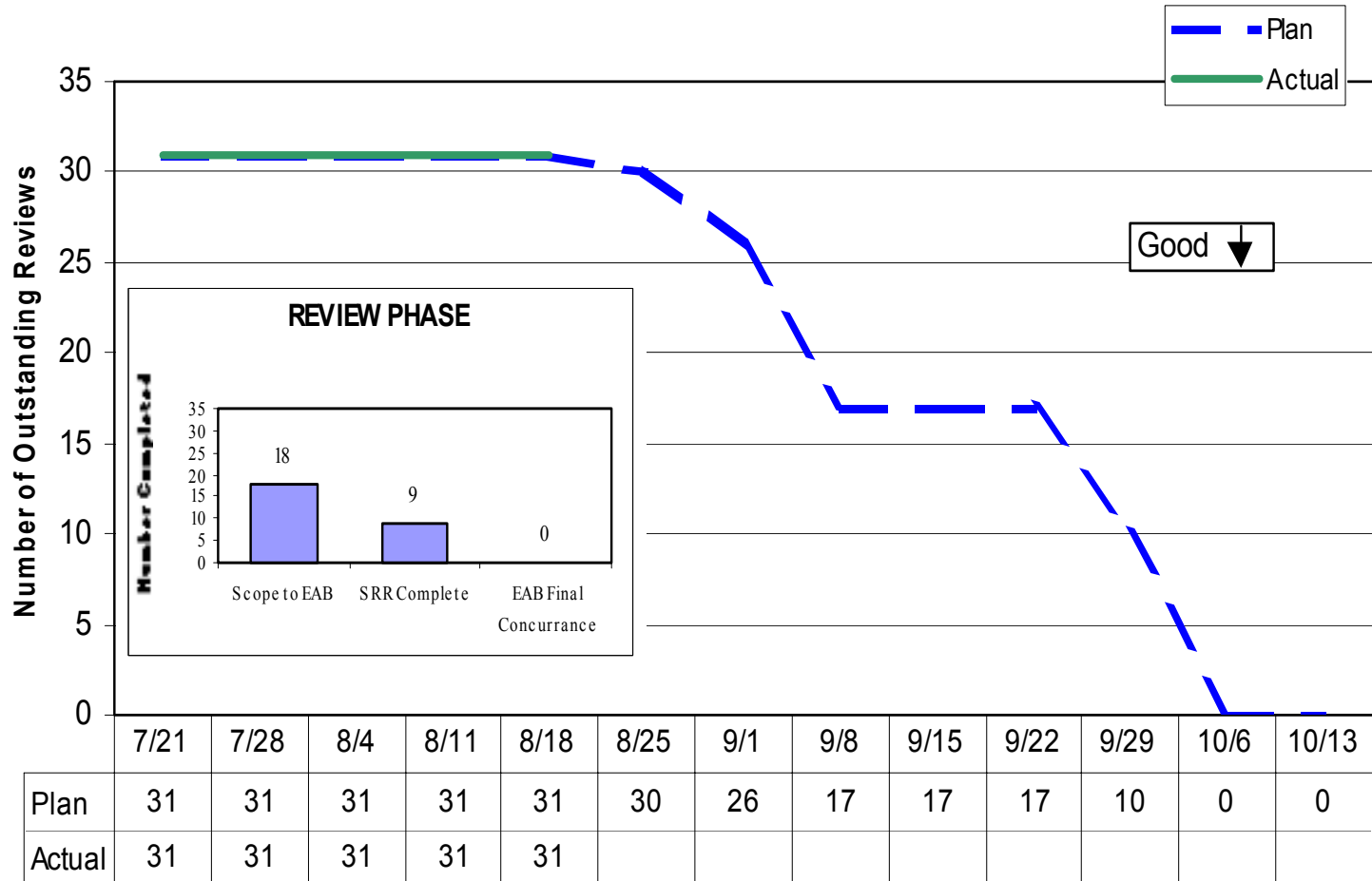


### PROGRESS MEASURE

MILESTONE ACTIVITIES	TARGET START	TARGET END	CURRENT START	CURRENT END	ACTUAL % COMPL
1 MOBILIZE	05/20/02	06/29/02	05/20/02	06/29/02	100%
2 REPLACEMENT HEAD TRANSPORTED MIDLAND TO DB	08/01/02	08/04/02	07/17/02	07/18/02	100%
3 CONTAINMENT SHIELD BUILDING CONCRETE REMOVAL	07/31/02	08/16/02	08/12/02	08/19/02	100%
4 OLD DB REACTOR HEAD READY FOR REMOVAL	07/09/02	08/25/02	06/27/02	08/24/02	95%
5 REPLACEMENT HEAD INSTALLATION AT DB	08/26/02	09/28/02	08/26/02	09/28/02	
6 CONTAINMENT DESIGN RESTORATION AT DB	08/26/02	09/28/02	08/26/02	09/28/02	
7 MODE 5 (REACTOR HEAD ON THE VESSEL)	09/29/02	09/29/02	11/04/02	11/04/02	

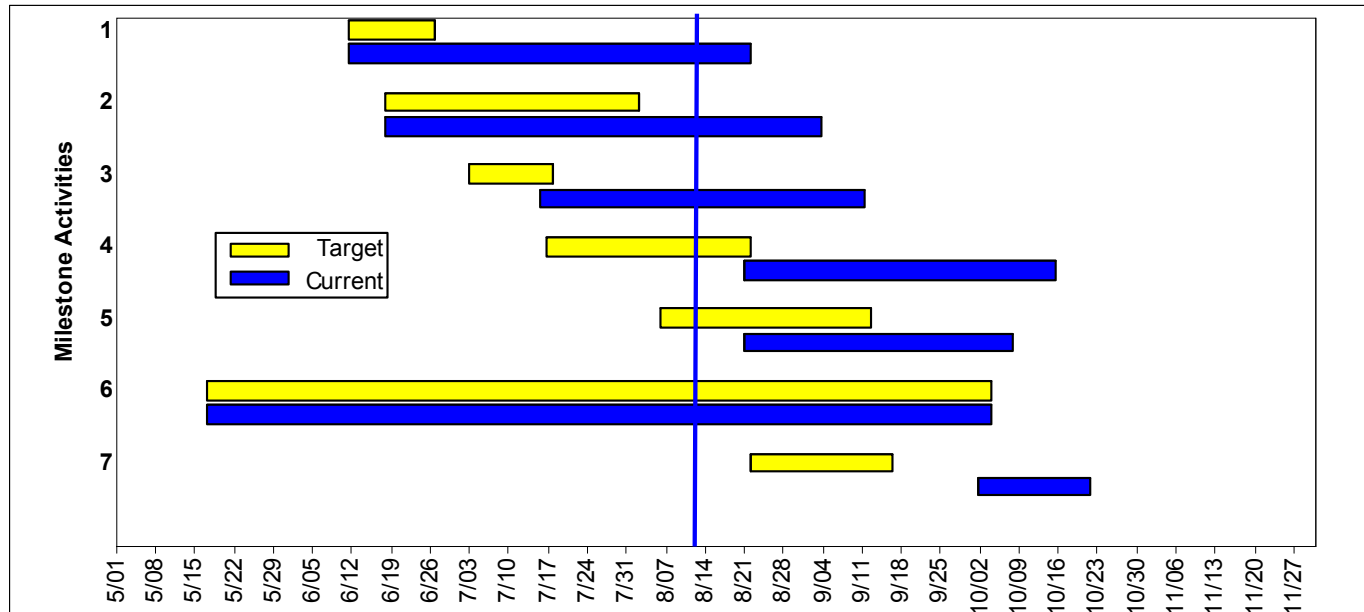
# Restart Progress

## SYSTEM READINESS REVIEWS



# Restart Progress

## PHASE 2 PROGRAM REVIEWS



### PROGRESS MEASURE

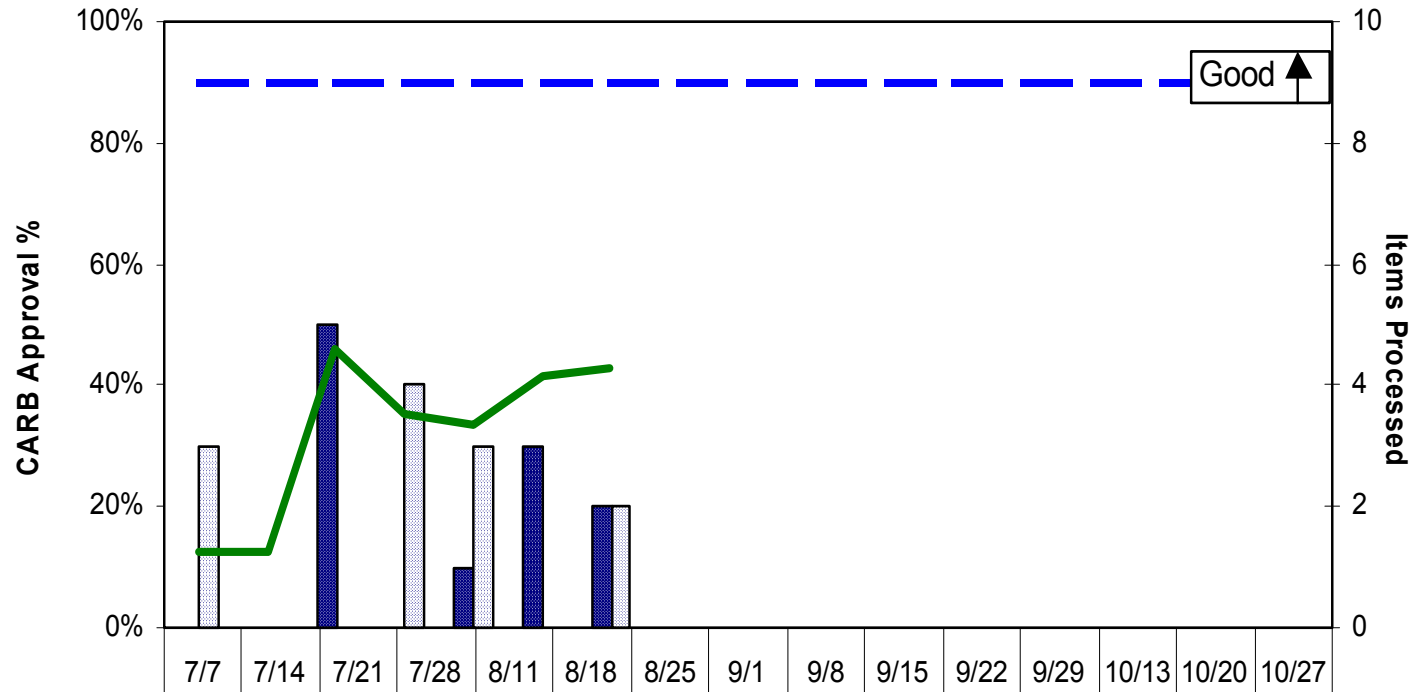
MILESTONE ACTIVITIES	TARGET START	TARGET END	CURRENT START	CURRENT END	ACTUAL % COMPL
1 BORIC ACID CORROSION CONTROL PROGRAM	06/11/02	06/26/02	06/11/02	08/21/02	93%
2 CORRECTIVE ACTION PROGRAM	06/17/02	08/02/02	06/17/02	09/03/02	74%
3 INSERVICE INSPECTION (ISI) PROGRAM	07/02/02	07/17/02	07/15/02	09/10/02	45%
4 ENGINEERING CHANGE/PLANT MODIFICATION PROGRAM	07/16/02	08/21/02	08/20/02	10/14/02	
5 OPERATING EXPERIENCE PROGRAM	08/05/02	09/12/02	08/20/02	10/07/02	
6 PSA PROGRAM PHASE 2 (PILOT)	05/17/02	10/03/02	05/17/02	10/03/02	58%
7 REACTOR COOLING SYS UNIDENTIFIED LEAKAGE PROGRAM	08/21/02	09/16/02	10/01/02	10/21/02	





# Restart Progress

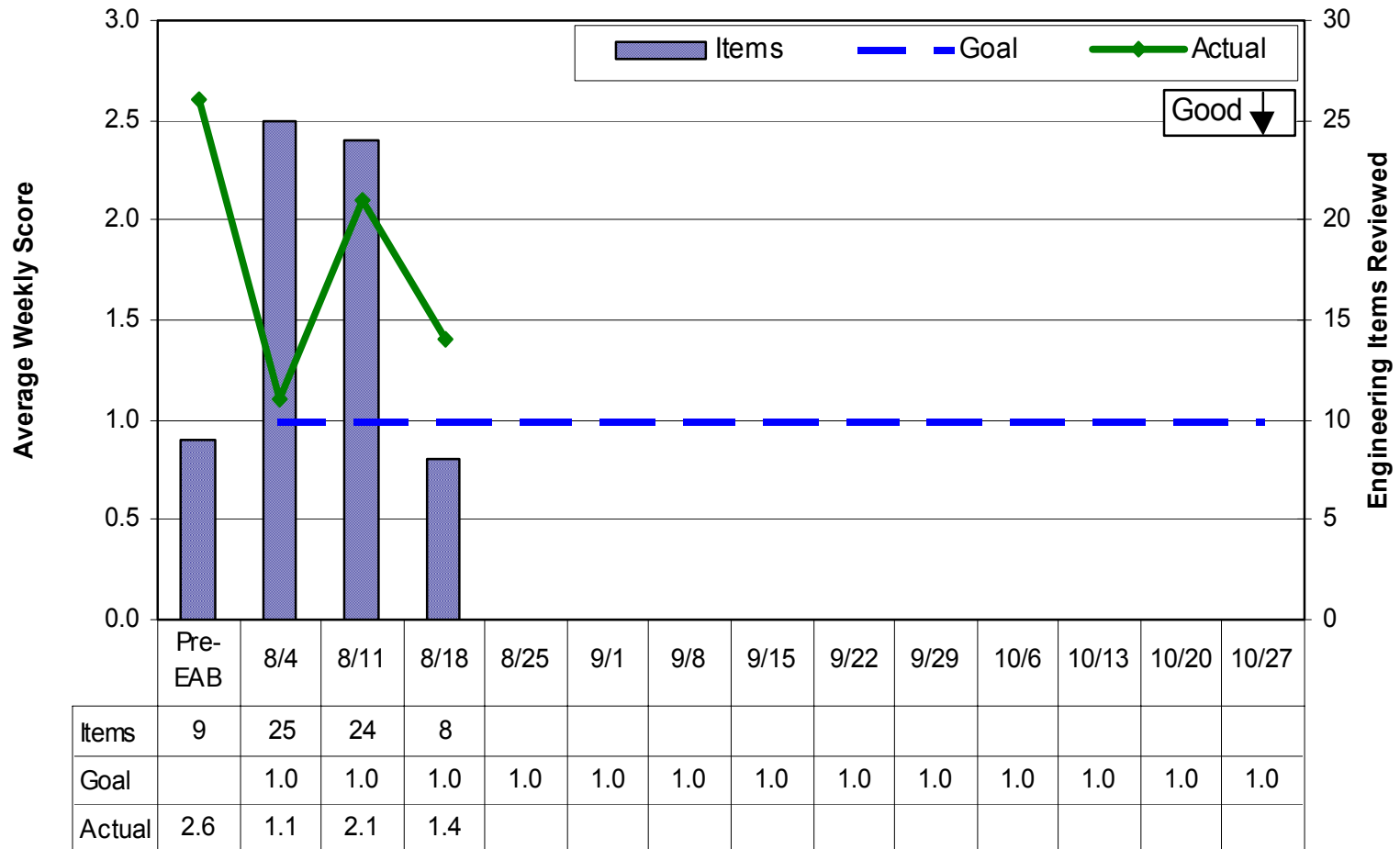
## ROOT CAUSE QUALITY



	7/7	7/14	7/21	7/28	8/11	8/18	8/25	9/1	9/8	9/15	9/22	9/29	10/13	10/20	10/27
Approved	0	0	5	0	3	2									
Rework	3	0	0	4	0	2									
Goal	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Cum Actual	13%	13%	46%	35%	42%	43%									

# Restart Progress

## ENGINEERING QUALITY



# **Nuclear Quality Assessment Quality Standards**



***Bill Pearce***

***Vice President -- Oversight***

# **Nuclear Quality Assessment Root Cause Evaluation**

- **Evaluation performed by recognized outside team leader**
- **Team also consisted of Perry and Beaver Valley employees**
- **Independent root cause of missed opportunities**
- **Corrective actions being implemented**

# Nuclear Quality Assessment Preliminary Conclusions

## Root Cause

- FENOC nuclear safety values, behaviors and expectations were inadequate to enable oversight to effect needed positive change in station operations

# **Nuclear Quality Assessment Preliminary Conclusions**

## **Contributing Causes**

- Ineffective Training for previous event
- Process for providing oversight of the oversight function was less than adequate
- For a period of time, the management of the audit/evaluation process was not independent from the management of the corrective action process

# Nuclear Quality Assessment

## Preliminary Conclusions

### Actions

- Elevate standards
- Hold line organization accountable to higher standards
- Increased intrusiveness
- Raise tough issues
- Escalate unresolved issues to higher management

# Nuclear Quality Assessment

## Quality Standards

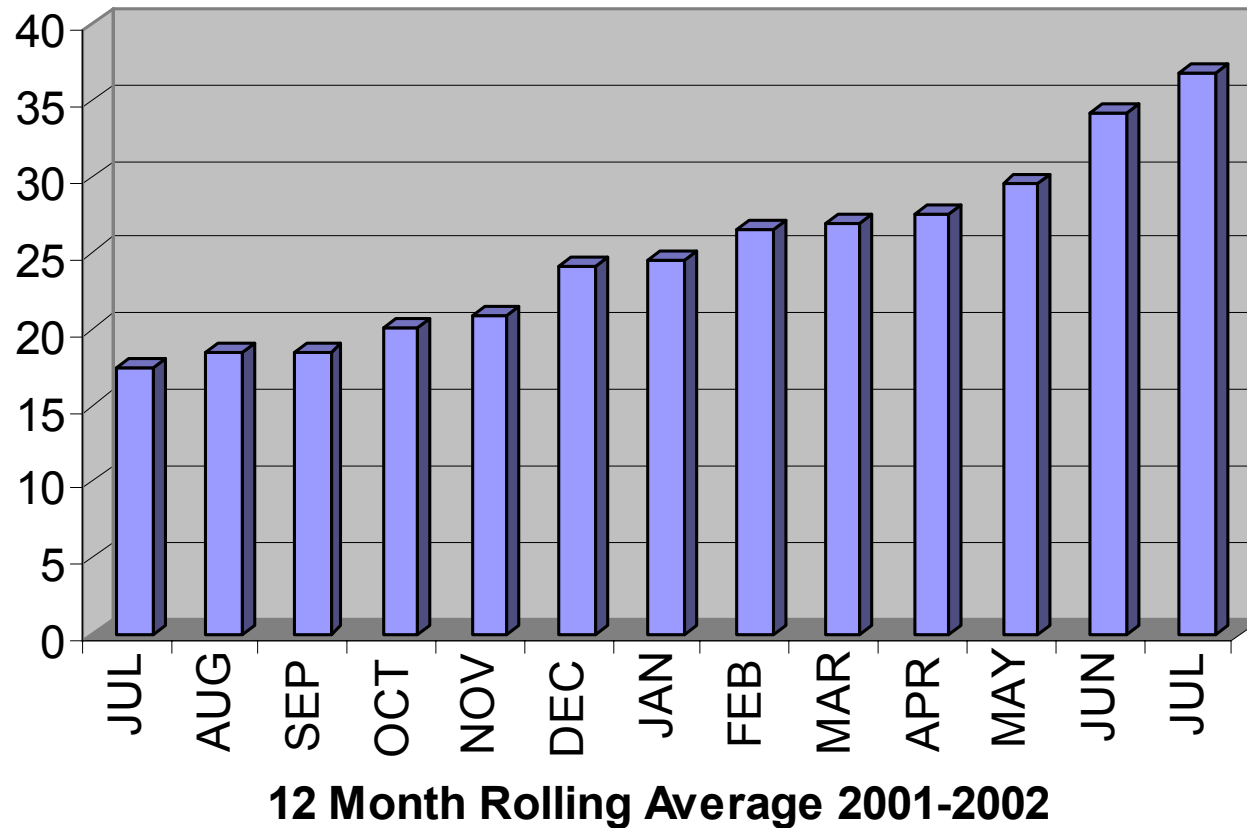
### Assessment of Key Activities

- Review board meetings
- In-depth technical review of engineering products
- Field verification of actual conditions
- Independent parallel reviews



# Nuclear Quality Assessment Quality Standards

Condition Report Generation Rate



# Nuclear Quality Assessment

## Examples of Results

### Increased Intrusiveness

- Most recent assessment identified 77 issues
- Real-time assessment of activities in process
- Ensuring product quality upon activity completion