

IBM Maximo for Nuclear Power: N 7.5 Functionality Survey

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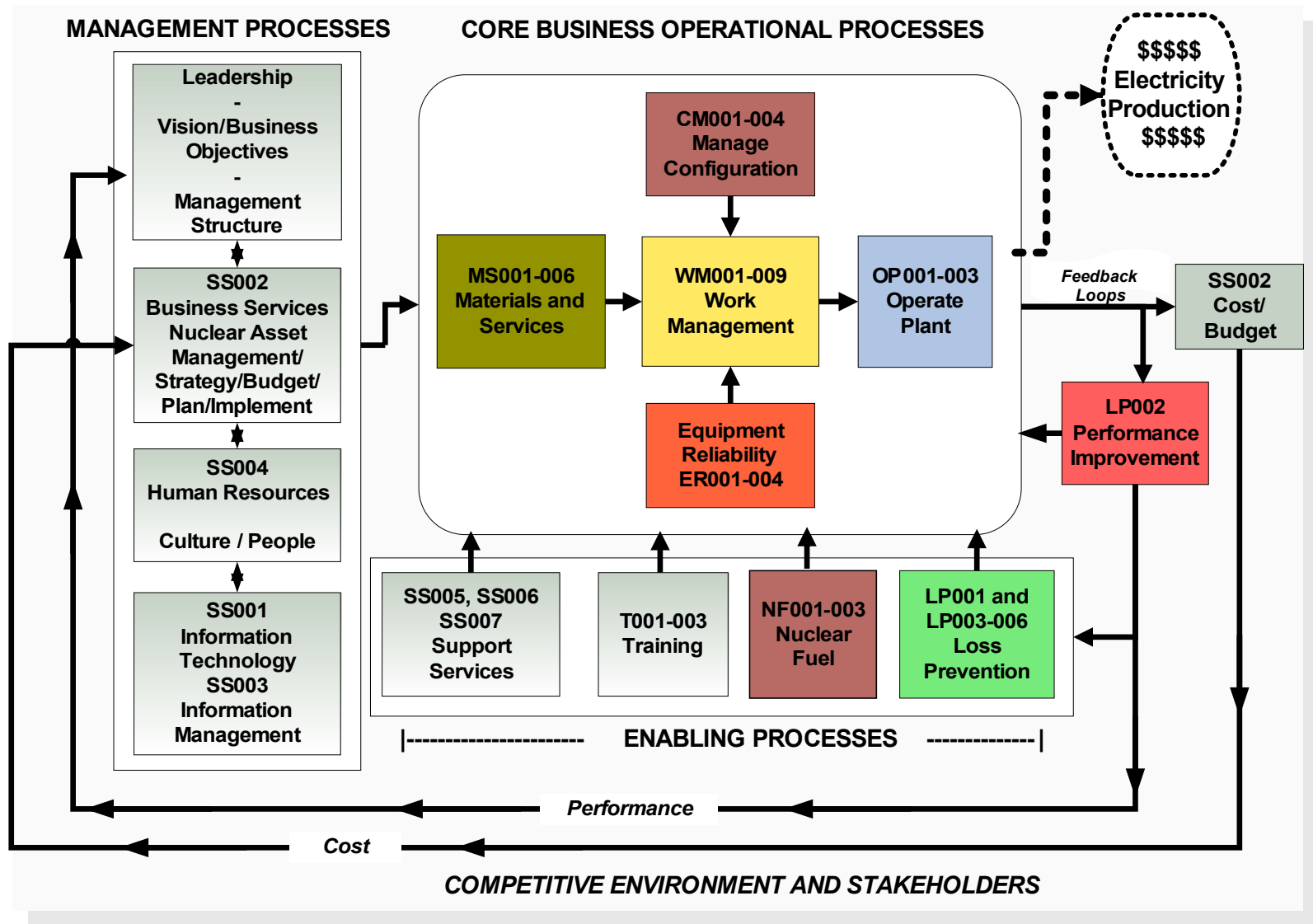


Topics

- **Foundations for Maximo Nuclear**
- **Product Overview: Nuclear Industry Solution**
- **Maximo Nuclear for New Plant Construction**

Foundations for Maximo Nuclear

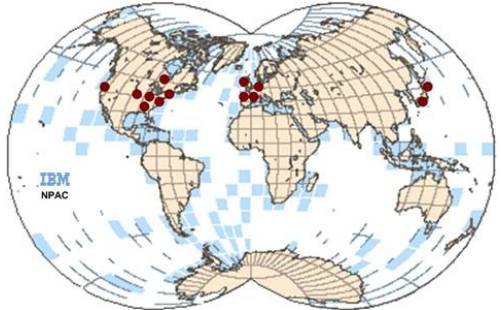
Foundation 1: Industry Best Practices and the SNPM



Standard Nuclear Performance Model

Foundation 2: Defined By Extensive Client & Industry Engagement

* Board Level: Nuclear Power Advisory Council



Nuclear Power Advisory Council

- Under Development:
 - Nuclear Business Maturity Model

IBM NPAC Members:
 Exelon
 Dominion
 Southern Nuclear
 TVA
 Entergy
 PPL



Development Partners



Dominion



* Working Level: Maximo Nuclear Development Partnership

- Dev Partnership Goal: Win-Win
 - Move Product Forward
 - Partners' Imprint on Maximo Nuclear
 - Satisfy Market Needs
 - Product Uptake

Foundation 3: Extends IBM Maximo Enterprise Asset Management

Asset Management

- Locations
- Assets
- Linear Assets
- Repair Facilities
- Asset Templates
- Meters
- Relationships
- Meter Groups
- Conditioning Monitoring
- Failure Codes
- Classifications / Specifications

Work Management

- Job Plans
- Routes
- Service Items
- Work Order Tracking
- Failure Reporting
- Safety
- Quick Reporting
- Labor
- Qualifications
- PM Forecasting
- Tools / Crafts / Companies
- Preventive Maintenance
- Master PM
- Assignment Manager

Materials Management

- Item Master
- Service Items
- Tools
- Stocked Tools
- Inventory
- Inventory Usage
- LIFO/FIFO Costing
- Consignment
- Condition Codes
- Storerooms
- Transfer via Shipment
- Classifications / Specifications
- Hard/Soft Reservations

Purchasing

- Purchase Requisitions
- Purchase Orders
- Receiving
- Shipment Receiving
- Invoices
- Invoice Reversals
- Request for Quotation
- Companies
- Company Master
- Terms and Conditions
- Desktop Requisitions
- Currency Codes
- Exchange Rates
- Chart of Accounts
- Cost Management

Contract Management

- Purchase Contracts
- Lease / Rental Contracts
- Labor Rate Contracts
- Master Contracts
- Warranty Contracts
- Software Contracts
- Premium Pay Rates
- Payment Schedules

Service Management

- Service Catalogs
- SLA Management
- Service Requests
- Incidents
- Problems
- Changes
- Releases
- Solutions
- Ticket Templates

Enhanced Workflow in SLAs and Escalation Manager

Configuration – UI, Database Fields, and Applications

Maximo Integration Framework (MIF) – Native Integration Capabilities

KPIs / Reporting / Analysis

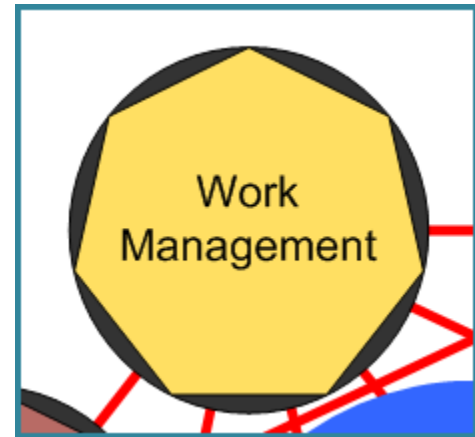
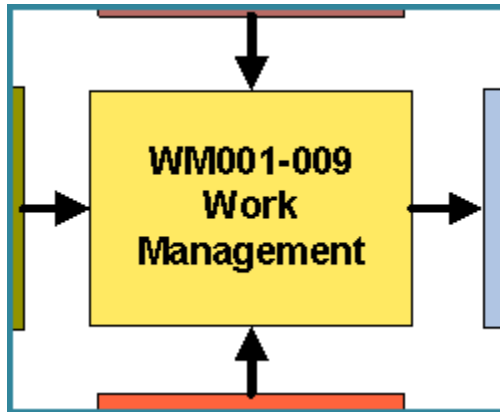
Security & Administration

Product Overview: Nuclear Industry Solution

Nuclear Process Support Extends Core Maximo EAM



- * Work Order
- * Work Permits
- * Equipment Groups
- * Impact Plans



The Work Order Remains Central to Maximo Nuclear

Work Order Tracking (Nuc)

Bulletins: (0) Go To Reports Start Center Profile Sign Out Help

Find: Select Action

List Work Order Plans Clearance Assignments Related Records Actuals Safety Plan Impact Plans Log Data Sheet Failure Reporting Program Data Specifications

Work Order: 1203 Vibrations trending upward over past two ISI runs

Location: 2-PUMP Unit 2, RHR A Pump

Asset: RHR 100 RHR Group 100

Configuration Item: 1234567

Parent WO: PUMP \ CNTRFGL

Classification: Centrifugal Pump

Commitment: Corrective Action Control?

Work Location: Modes: 1,2,3 MER: 3A

Launch Entry Name:

Site: BEDFORD

Unit: UNIT 2

Plant System: RHEATRBM

Power Block?

Safety Division: DIV1

Instrument Channel: NA

Class: WORKORDE

Work Type: CM

Work Category: ELECT

GL Account: Failure Class: PUMPS

Problem Code: As Found Code: Storeroom Material Status: Direct Issue Material Status: Work Package Material Status: Material Status Last Updated:

Attachments

Status: WAPPR

Status Date: 8/13/12 1:25 PM

Inherit Status Changes?

Accepts Charges?

Is Task?

Impact Plan Required?

Reference Impact Plan:

Clearance Protection Required?

Released from Clearances?

Under Flow Control?

Suspend Flow Control?

Flow Action: Flow Action Assist?

Job Details

Job Plan: JP11430A

Job Plan Revision #: 0

PM: WO Completion Code: Partial Performance? Retest?

Asset Details

Asset Up? Warranties Exist? SLA Applied? Charge to Store? Exception? Completion Code:

Priority

Asset/Location Priority: Priority: 8

Priority Justification: Risk Assessment:

The Clearances Tab Gives a Full View of the Clearance from the WO

Work Order Tracking (Huc) Bulletins: (0) Go To Reports Start Center Profile Sign Out Help

Find: Select Action

[List](#)
[Work Order](#)
[Plans](#)
[Clearance](#)
[Assignments](#)
[Related Records](#)
[Actuals](#)
[Safety Plan](#)
[Impact Plans](#)
[Log](#)
[Data Sheet](#)
[Failure Reporting](#)
[Program Data](#)
[Specifications](#)

Work Order: Site: Status:
 Parent WD: Unit: Plant System:

Selected Clearance:
 Clearance Revision:

Clearances: [Filter](#) 1 - 1 of 1 [Download](#)

Clearance	Revision	Description	Status	Pending Craft Approval?	Pending Acceptance of CL Rev?	Blocked?	Released?
1003	2	Troubleshoot and repair pump	ACTIVE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Associated Tags: [Filter](#) 1 - 6 of 6 [Download](#)

Tag ID	Location	Asset	App Position	Tag Status	Tag Type
1005	2-CB1		RO	APPLIED	DANGER
1006	2-CB2		RO	APPLIED	DANGER
1007		F23456	REMOVE	APPLIED	DANGER
1008	2-DISCH		CLOSED	APPLIED	DANGER
1009	2-SUCT		CLOSED	APPLIED	DANGER
1010	2-CS-PUMP		PTL	APPLIED	DANGER

Clearance Sign On/Off: [Filter](#) 1 - 2 of 2 [Download](#)

Sign On/Off	Date	Signed On?	Signed Off?	Work Complete?
WILSON	8/13/12 4:30 PM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
STANLEY	8/13/12 4:30 PM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[New Row](#)

Changes to the WO Related Records tab

Work Order Tracking (Ilucc) Bulletins: (0) Go To Reports Start Center Profile Sign Out Help

Find: Select Action [Icons]

List Work Order Plans Clearance Assignments **Related Records** Actuals Safety Plan Impact Plans Log Data Sheet Failure Reporting Program Data Specifications

Work Order: 1203 Vibrations trending upward over past two ISI runs Site: BEDFORD Status: INPRG

Related Work Orders: Filter 0 - 0 of 0 Download

Related Record Key	Description	Type	Class	Record Status	Relationship Status	Relationship
...No rows to display...						

Select Work Orders New Row

Related Tickets: Filter 1 - 1 of 1 Download

Related Record Key	Description	Class	Status	Relationship	CA Control?
1129	Vibrations trending upward over past two ISI runs	CORRECT_A	ACTIVE	ORIGINATOR	<input checked="" type="checkbox"/>

Details

Related Record Key: 1129 Vibrations trending upward over past two ISI runs Status: ACTIVE

Class: CORRECT_A Relationship: ORIGINATOR

Asset:

Location: 2-PUMP Unit 2, RHR A Pump Corrective Action Control?

Classification:

Select Tickets New Row

Related Equipment Groups: Filter 1 - 2 of 2 Download

Equipment Group	Description	Type	Equipment Group Modes	Status
GREEN	Outage Planning FEG	OUTAGE		ACTIVE
RED	Workweek 10 FEG	WORKWEEK	4,5,6	ACTIVE

Select Equipment Groups New Row

WO, Operational Impacts Tab

Work Order Tracking (Ilucc) Bulletins: (0) Go To Reports Start Center Profile Sign Out Help

Find: Select Action

[List](#)
[Work Order](#)
[Plans](#)
[Clearance](#)
[Assignments](#)
[Related Records](#)
[Actuals](#)
[Safety Plan](#)
[Impact Plans](#)
[Log](#)
[Data Sheet](#)
[Failure Reporting](#)
[Program Data](#)
[Specifications](#)

[Operational Impacts](#)
[Maintenance Impacts](#)

Work Order: 1203 Vibrations trending upward over past two ISI runs
 Site: BEDFORD Status: INPROG
 Unit: UNIT 2 Plant System: RHEATREM/

Impact Plan: RHRA007 RHR A Standard Impact
 Impact Plan Modes: 1,2,3 Op Impact Status: DRAFT
 IP Sched Code: IRF14 Unit: UNIT 2

[Tech Specs and Retest](#)
[Unavailability](#)
[Plant Response](#)

Tech Spec Applicability

Tech Specs Applicable? Tech Specs Comments: Enter the LCC when 2-CB1 is tripped


Tech Specs: [Filter](#) 1 - 1 of 1 [Download](#)


Tech_Spec	Description	Type	Unit	Applicability
3.5.3	RCIC System	TS	UNIT 2	MODE 1. MODES 2 and 3 with reactor steam dome pres

Details


Tech Spec: 3.5.3 RCIC System [Attachments](#)
 Type: TS Plant Technical Specifications Tech Spec Note: n/a
 Unit: UNIT 2
 Applicability: MODE 1. MODES 2 and 3 with reactor steam dome pres

WO, Program Data tab

Work Order Tracking (Nuc) Bulletins: (0) [Go To](#) [Reports](#) [Start Center](#) [Profile](#) [Sign Out](#) [Help](#) 

Find: Select Action 

[List](#) [Work Order](#) [Plans](#) [Clearance](#) [Assignments](#) [Related Records](#) [Actuals](#) [Safety Plan](#) [Impact Plans](#) [Log](#) [Data Sheet](#) [Failure Reporting](#) **[Program Data](#)** [Specifications](#)

Work Order: 
 Site:
 Status:

Equipment Reliability

Location:

Criticality:

PRA Code?

GRA Code?

Maint Rule?

Tech Spec?

Procurement Engineering

Asset:

Procurement Class:

Materials And Services

Location:

Safety Class:

Permits and Quick Permits

Maximo Nuclear		
Enhancement	Description	Why is it Important?
Permits	<p>Add the ability to create and manage powerplant permits. Supports a range of permit types corresponding to the requirements that accompany plant operations, maintenance, and engineering activities. Examples are Radiation Work Permits, Scaffolding, Confined Space, Heat Stress, Excavation, Hot Work, Fire Impairment, and Chemical Use Permits. Supports interface with external Permit systems as required.</p> <p>Provide complete independence of the Permit from the work processes while supporting full integration.</p>	<p>Permits complement other nuclear work processes. Permits are used to develop and manage the independent assessments and administrative controls that ensure work is preformed within the guidelines of plant supporting processes.</p>

Capturing and Transforming Process Steps and Data Into . . .

WID/Permit No. _____		Start Date: _____	
Work Description: _____		Type of Work:	
Resp. Org: _____		<input type="checkbox"/> Welding (Specify Type)	
Requested By: _____		<input type="checkbox"/> Grinding	
Phone No.: _____		<input type="checkbox"/> Torch Cutting	
Approval: _____		<input type="checkbox"/> Torch Heating	
Foreman/Supervisor		<input type="checkbox"/> Soldering	
Approval Date: _____		<input type="checkbox"/> Brazing	
		<input type="checkbox"/> Heat Treatment	
		<input type="checkbox"/> Other (Specify): _____	
*Work Authorization: _____			
Name (Printed)		Signature	Date
		_____	_____
*Required for activities described in Section 3.1.F.			

WORK PLACE INSPECTION REQUIREMENTS	
YES	N/A
<input type="checkbox"/>	<input type="checkbox"/>
All welding, burning, and grinding equipment has been inspected and is in safe working order.	
<input type="checkbox"/>	<input type="checkbox"/>
All floor or wall openings including gaps under and around doors are adequately covered to contain sparks, slag, and molten metal within the immediate work area.	
<input type="checkbox"/>	<input type="checkbox"/>
Work location has been inspected and any combustible materials or sensitive equipment identified, adequately protected, and/or removed.	
<input type="checkbox"/>	<input type="checkbox"/>
Shift Manager notified if work involves TIG welding.	
<input type="checkbox"/>	<input type="checkbox"/>
Any additional requirements listed below have been met and reviewed with personnel.	
<input type="checkbox"/>	<input type="checkbox"/>
Fire Watches assigned are trained and briefed on their duties and responsibilities.	
<input type="checkbox"/>	<input type="checkbox"/>
Adequate smoke control measures have been provided or smoke detectors in the vicinity of the hot work have been removed from service with an approved Impairment Permit.	
<input type="checkbox"/>	<input type="checkbox"/>
An appropriately rated fire extinguisher is available for use by the hot work fire watch.	

Work Area Prepared By:	_____	_____	_____	_____
(Must be signed to begin work)	Name (Printed)	Signature	Date	Time

Additional Requirements: (Use Additional Pages if Required)

... Maximo - Example: Hot Work Permit, Specifications tab

* Hot Work Permit characterization task tied to multiple data-gathering steps

The screenshot displays the Maximo Permits (Nuc) interface. At the top, there is a navigation bar with options like 'List', 'Permit', 'Plans', 'Clearance', 'Related Records', 'Log', 'Specifications', and 'Inspections'. The 'Specifications' tab is highlighted with a red box. Below this, the permit details for 'HW Permit' are shown, including its classification 'PERMIT GROUPS \HOT WORK' and site 'BEDFORD'. The 'Specifications' table below is currently empty, showing the message '...No rows to display...'. Below that is the 'Tasks With Specifications' table, which lists tasks for the permit. The first row is highlighted with a red box:

Sequence	Task	Description	Class Description	Status
1	10	Indicate Type(s) of Hot Work Work to be Perfor	The Type(s) of Hot Work to be Performed	WAPPR
2	20	Perform Initial Inspection Evaluation and Establis	Hot Work Initial Evaluation and Requirements	WAPPR
3	30	Establish Any Additional Requirements	Additional Requirements to be Specified for This	WAPPR
4	40	Evalaute if FPS Work Start Authorization is Nee	Is Fire Protection Supervisor Permission Nee	WAPPR
5	50	Supervisor to Certify Permit Requirements Begir	Supervisor Review of Permit Conditions at Job S	WAPPR
6	70	Supervisor Permit Closeout	Supervisor Final Inspection - Permit Closure	WAPPR

Below the 'Tasks With Specifications' table is the 'Task 10 Specifications' table, which is also highlighted with a red box. It shows the specific attributes for task 10:

Attribute	Description	Data Type	Alphanumeric Value	Numeric Value	Unit of Measure	Table Value
▶ HWMLDTYP	The Type(s) of Welding to be Performed	ALN				
▶ HWGRND	Is Grinding Involved?	ALN				
▶ HWTRCCLUT	Is Torch Cutting Involved?	ALN				
▶ HWTRCHET	Is Torch Heating Involved	ALN				
▶ HWBRAZE	Is Brazing Involved?	ALN				
▶ HWSOLDR	Is Soldering Involved?	ALN				
▶ HWHTTIRT	Heat Treatment Process?	ALN	NO			
▶ HWOTHER	Specify Other Hot Work Types	ALN				

Example 2A: Quality Plan Permit, Plans tab

* Quality Planning Permit Task is Tied to Plant Resources

The screenshot displays the 'Permits (Nuc)' application interface. At the top, there is a navigation bar with 'List', 'Permit', 'Plans', 'Clearance', 'Related Records', 'Log', 'Specifications', and 'Inspections'. The 'Plans' tab is selected and highlighted with a red box. Below this, the permit details for 'QP1' are shown, including 'Quality Plan using permit model', 'Permit Type: QP', 'Site: BEDFORD', and 'Status: WAPPR'. A red box highlights the 'Quality Plan using permit model' text.

The 'Children of Permit QP1' section shows a table with columns: Sequence, Record, Record Class, Summary, Location, Asset, and Status. It indicates that there are no rows to display.

The 'Tasks for Permit QP1' section shows a table with columns: Sequence, Task, Summary, Estimated Duration, Status, Owner, and Owner Group. The first row, '10 Pre-requisites', is highlighted with a red box. Other tasks include 'Applicable Procedures', 'Drawing', 'Tech. Specifications / Vendor documents', 'Personnel Qualification', and 'Calibration'.

The 'Labor' section shows a table with columns: Task, Craft, Skill Level, Vendor, Quantity, Labor, Regular Hours, Rate, and Line Cost. The first row, '10 INSPECT LEVEL_1', is highlighted with a red box. A 'Details' section below shows the configuration for task 20, including 'Task: 20', 'Craft: INSPECT', 'Skill Level: LEVEL_1', 'Vendor', 'Labor Contract', 'Quantity: 1', 'Labor', 'Regular Hours: 0.00', 'Rate: 24.00', and 'Line Cost: 0.00'.

Example 2B: Quality Plan Permit, Inspections tab

* Ties Permit Task to Inspections that Maintain Permit Validity

The screenshot displays the 'Permits (Nuc)' application interface. The 'Inspections' tab is selected, showing details for permit 'QP1' and task '280'. The task summary is 'Measurement of insulation resistance and direct cui'. Below this, a table lists two inspection records:

Inspected By	Inspection Date/Time	SAT	Inspection Note
JDAVIES	11/9/09 7:49 PM	<input checked="" type="checkbox"/>	100% Humidity day (marginal reading 100 Mega Ohm)
FINLEY	11/16/09 7:50 PM	<input checked="" type="checkbox"/>	reading good (500 Mega Ohms)

The interface also includes a 'Details' section for the selected inspection record, showing fields for 'Inspected By' (JDAVIES), 'Inspection Date/Time' (11/9/09 7:49 PM), and 'SAT?' (checked).

Example 3: RWP Posting Report, displaying RWP Results

Tivoli. software

IBM®

RWP Posting Report (CPI)

This Radiation Work Permit is Approved for use

Printed On: 29 June, 2011 and is Valid from 17 July, 2011 to 31 August, 2011

Siteid: GNOCA **Unit:** UNIT 1 **RWP#:** 1032 **Status:** APPR

RWP Description: RWP: Setup of Backup Spent Fuel Cooler for Core Oflow in Refueling

Component: GNA1-SFS, null **Description:** Spent Fuel Pool Cooling System

Work Orders Allowed under this Permit - VERIFY Relationship status = "CURRENT" for each shift worked

Wo No.	Location	Asset	WO Description	WO Status	Relationship Status
1026			testtest	WAPPR	PENDADD
1001			Configuration Review and Test	WAPPR	PENDADD
1025	GNA1-SFS		Install Back-up Spent Fuel Cooling System for Outage	WAPPR	PENDADD

General Instructions

NO Installed plant fluid systems may be opened under this RWP

Any work within 3 ft of spent fuel pit water surface requires HP monitoring

HP Emergency Line ext. 5555

Dosimetry Requirements

Extremity Dosimetry Required None

Whole Body Dosimetry Required 0-200 Alarminc Dosimeter: SET AT 25 mr

Initial Area Survey

Average Area Doserate 7 mr/hr

Average Contamination Levels 10 dpm/cm²

Airborne Activity Level 0.05 DAC

Doserate of Hot Spot(s) if any 200 mr/hr @ 2 ft from Skimmer at pool surface

Protective Clothing Requirements

Are Booties Required? Yes

Type(s) of Coverall(s) Required Cotton, taped to booties and gloves. Plastics outer in vicinity of Filter Cask

Are Glove Liners Required? Yes

Is a Cotton Hood Required? Yes

Are Rubber Gloves Required? Yes, Doubled if crossing stepoff at Filter Cask

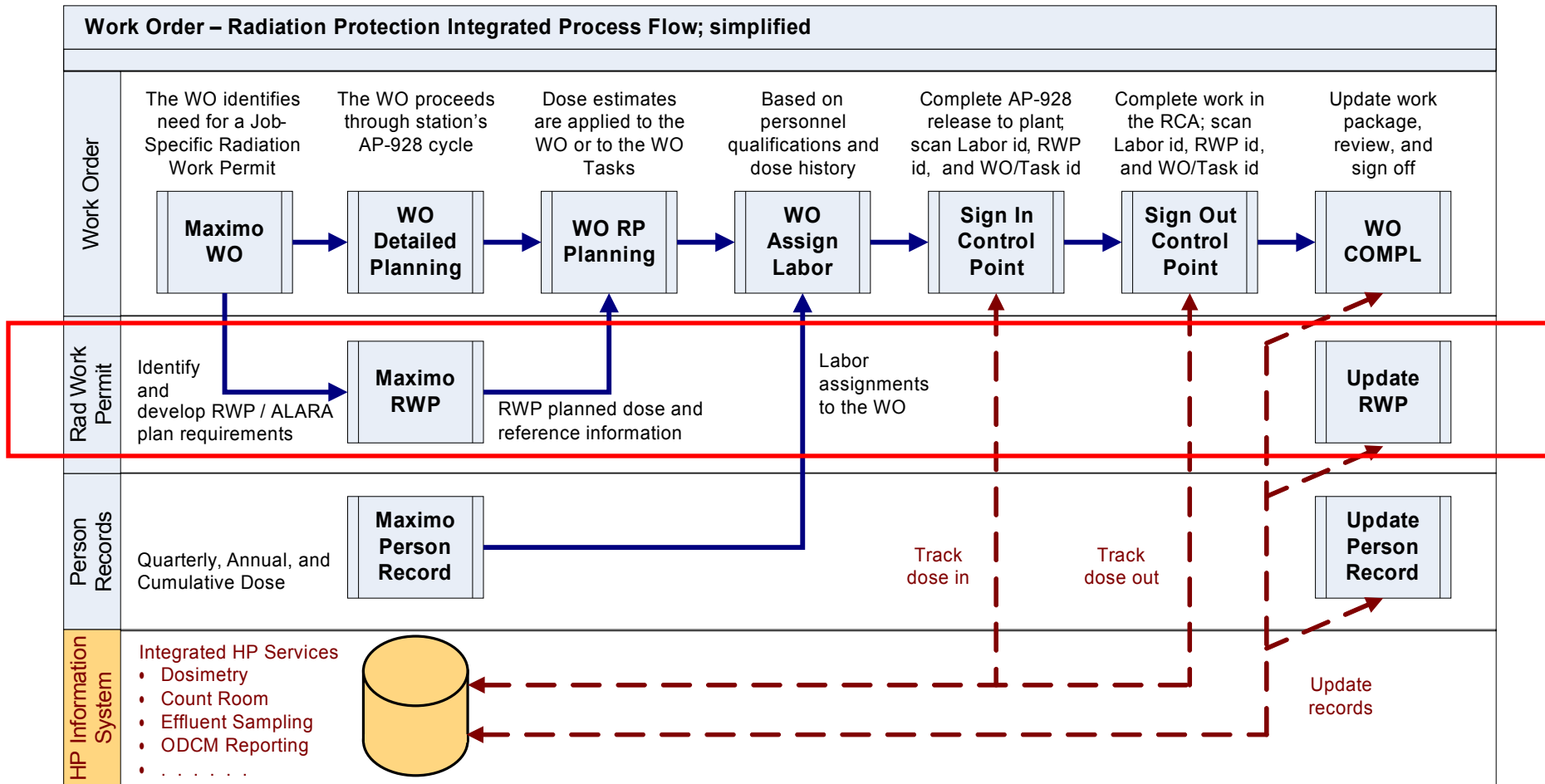
Are Rubber Overshoes Required? Yes, 2nd pair if cossing second stepoff at Filter Cask

Respiratory Protection Requirements

Respirator Cartridge N/A

Respirator Type None

Complex integration of a Radiation Work Permit, Work Order, Personnel Records, and External Systems



Example 4: Permits and Permit Requests Report



All Permits and Permit Requests

by Type and Scheduled Start Date

Permit Number	Description	Status	Valid From	Schedule Start	Expires at	Related Records	Record Status	Relationship Status	Scheduled Start
Unit: =BEDFORD Permit Number: Unit:									
Unit: BEDFORD Site:									
Chemical Use Permit									
PERMITB01	- a permit record	WAPPR							
1168		WAPPR							
Scaffold Permit									
PERMIT02		WAPPR				2000	WAPPR	CURRENT	
						5002	WAPPR	PENDADD	
						1022	WSCH	CURRENT	
P01		WAPPR							
PERMIT03		WAPPR				1088	COMP	PENDADD	
						1093	WAPPR	CURRENT	

Example 4 (con't): Permit Requests portion of the report

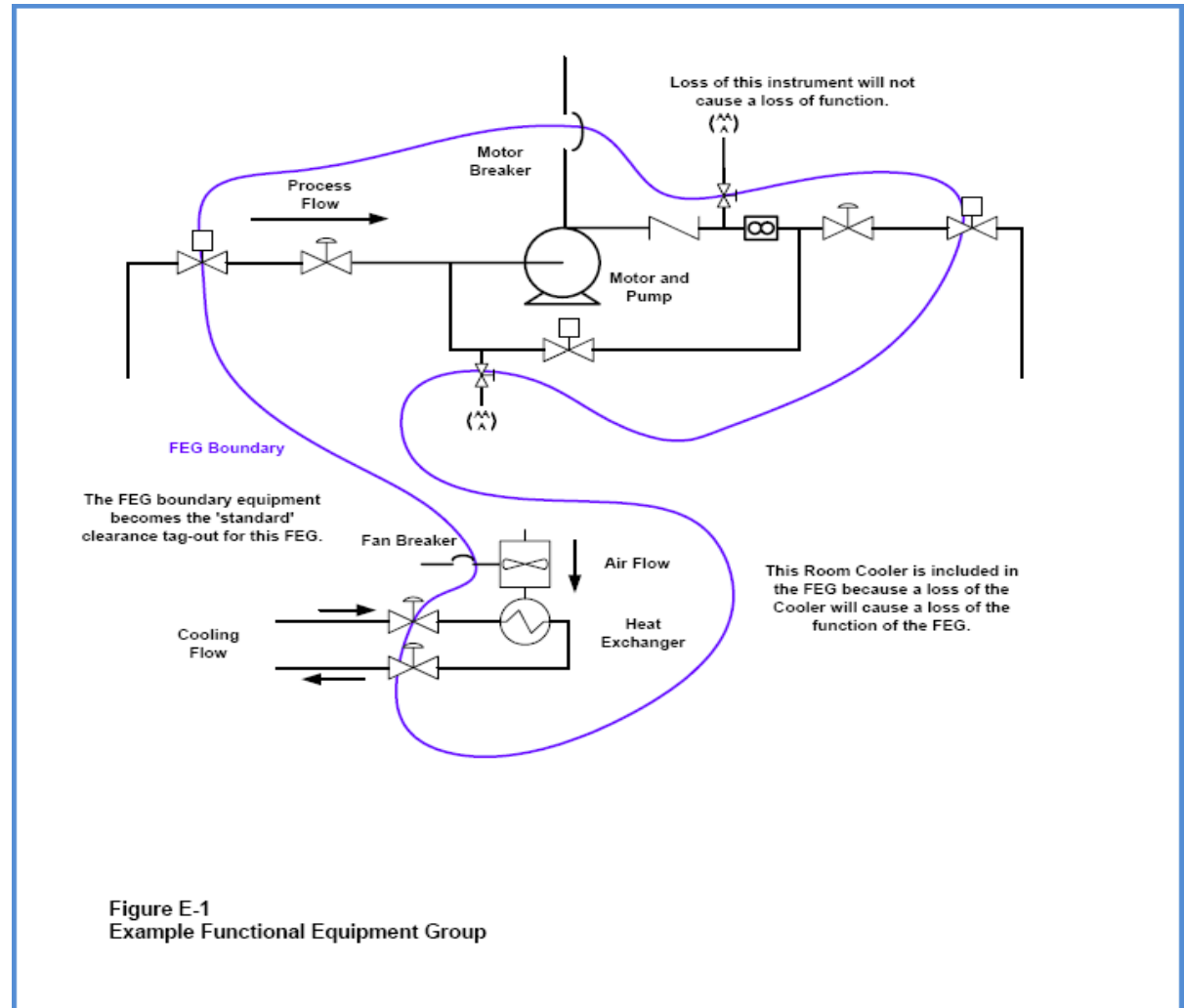


Requesting Record	Description	Status	Schedule Start	Generation Mode	Request Description
Site: BEDFORD					
Confined Space Permit					
W002		APPR		PERMGRP	
W002		APPR		REQUEST	
Excavation Permit					
W003	TTTTT	WAPPR		PERMIND	
W002		APPR		PERMGRP	
Fire Impairment Permit					
W003	TTTTT	WAPPR		PERMIND	
Heat Stress Permit					
W003	TTTTT	WAPPR		PERMGRP	

Equipment Groups

Maximo Nuclear Release		
Enhancement	Description	Why is it Important?
Equipment Groups	<p>Add the ability to relate Maximo Locations into equipment groupings. Through these groupings, WOs, PMs, Clearances, Tags, and Permits may also be grouped. The groupings may consist of traditional plant systems, or may extend beyond the notion of hierarchal system roll-ups to include other grouping concepts. In addition, the grouping of Maximo Tags on a clearance into pre-established boundary groups to facilitate complex configuration management evolutions using the Clearance Revision process.</p>	<p>Functional drivers in the nuclear industry include the widely accepted scheduling practices based on Functional Equipment Groups. The functionality is extended to any grouping need extending across one or multiple Maximo objects where the grouping is based on Location or a related characteristic. The capability is also extended to Assets through their associated Locations.</p>

Equipment Groups Support the Industry's Approach to Scheduling



Reference EPRI 1007935,
Critical Component
Identification Process –
Licensee Examples,
Scoping and Identification
of Critical Components in
Support of INPO AP913

Equipment Groups (Nuc) Screenshot

Equipment Group (Nuc) Configuration:

- Equipment Group: Control Building Chilled Water, Division A
- Type:
- Boundary EG?:
- Equipment Group Modes:
- Site:
- Unit:
- Status:
- Owner Group:
- Note:

Associated Locations Table:

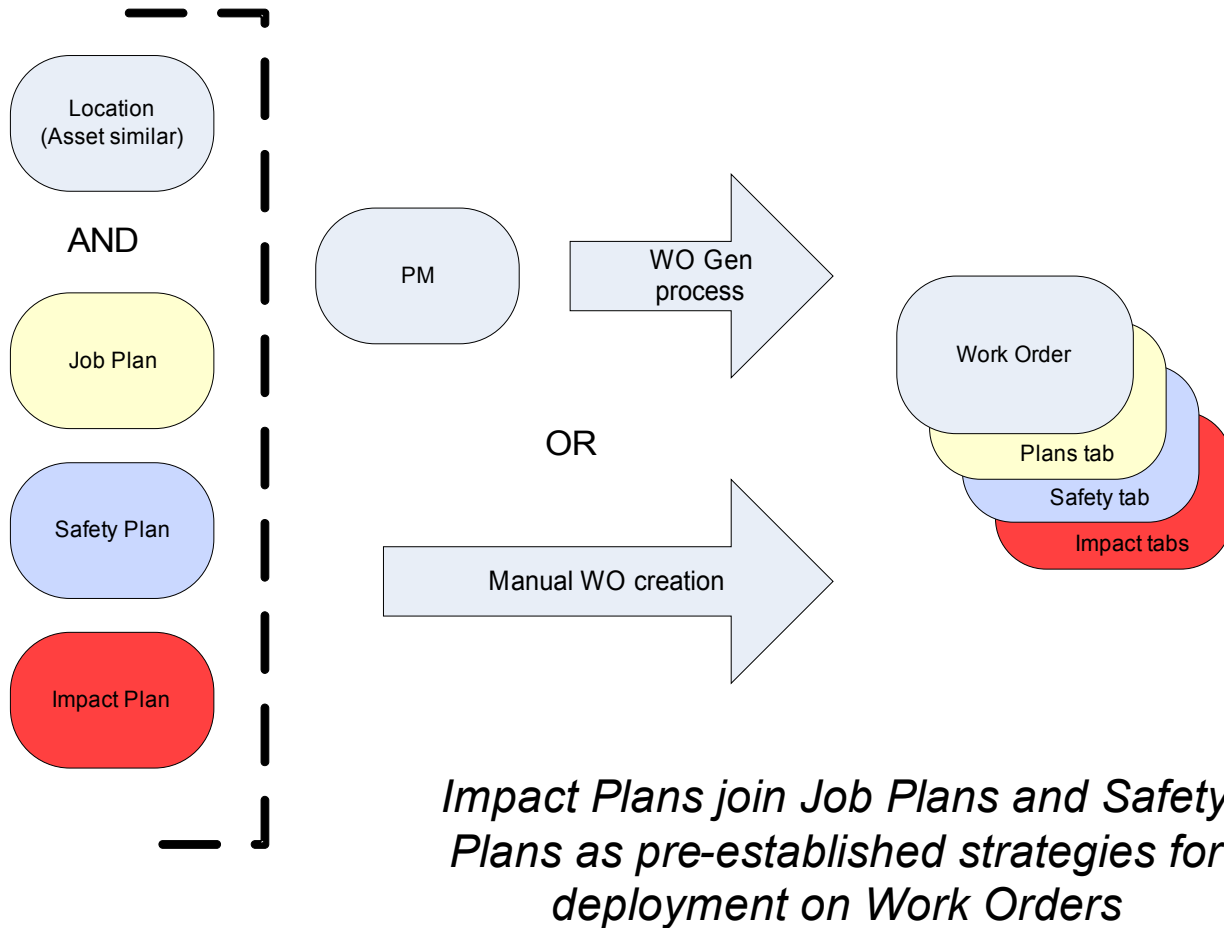
Location	Description	Site	Unit	Plant System	Default Group
CBCW-P2A	Chilled Water Pump 2A	BEDFORD	UNIT 2	CBCW	<input checked="" type="checkbox"/>
CBCW-AV10A	Chilled Water Pump Suction Valve AV10A	BEDFORD	UNIT 2	CBCW	<input checked="" type="checkbox"/>
CBCW-CV11A	Chilled Water Pump Check Valve AV11A	BEDFORD	UNIT 2	CBCW	<input checked="" type="checkbox"/>
CBCW-AV12A	Chilled Water Pump Discharge Valve AV12A	BEDFORD	UNIT 2	CBCW	<input checked="" type="checkbox"/>
CBCW-MV13A	Chilled Water Pump Recirculation Valve AV13A	BEDFORD	UNIT 2	CBCW	<input checked="" type="checkbox"/>
CBHV-AHU2A	Control Building Air Handling Unit AHU2A	BEDFORD	UNIT 2	CBHV	<input type="checkbox"/>

Details for CBCW-P2A:

- Location: Chilled Water Pump 2A
- Site:
- Unit:
- Plant System:
- Default Group?:

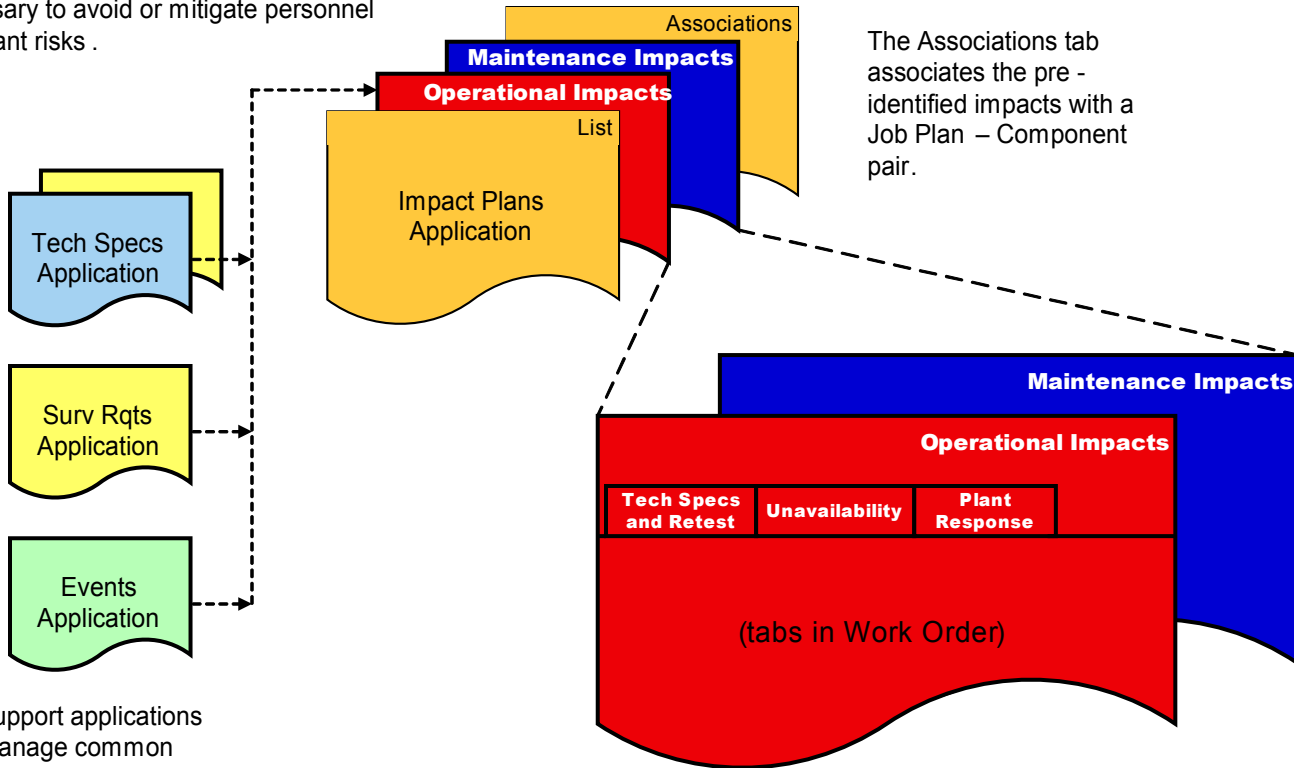
Equipment Group and Related Equipment Group are work management, operational management, or plant engineering flags on the WO, PM, Permit, Clearance and Tag records.

The Impact Plan Application



Impact Plan Schema

The Impact Plan application permits preidentification of the operational and maintenance challenges associated with maintenance, and the actions necessary to avoid or mitigate personnel and plant risks.

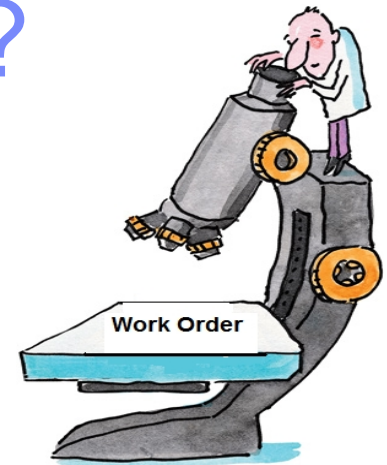


The Associations tab associates the pre-identified impacts with a Job Plan – Component pair.

Support applications manage common plant data.

Operational and maintenance impacts brought over from the template are validated and adjusted as necessary for the specific Work Order.

What's New in Impact Plans?



An Impact Plan may be Automatically Associated with the WO during Job Plan Selection

The screenshot displays the 'Work Order Tracking (Nuc)' interface. On the left, the 'Job Details' section shows 'Work Order: 7200' and 'Location: NEEDHAM'. A red arrow points from the 'Job Plan' dropdown menu to a 'System Message' dialog box. The dialog box contains the text: 'BMXAK0414E - The current work order has a job plan and asset or location combination that matches the combination specified in the 1002 template impact plan. Do you want to use this template to generate a working impact plan now?' with 'Yes' and 'No' buttons. Another red arrow points from the 'System Message' to the 'Impact Plan' field in the 'Work Order Tracking (Nuc)' window below. The 'Impact Plan' field is set to '1003' and 'IP AUTO SELECT Demonstration', with a green checkmark next to it. The 'Select Value' window in the background shows a list of job plans, including '12 MPH RED', '40 MPH RED', '401 Spot Patching', 'APPLREQ Application Request', 'BREAKINSP Breaker Inspection', 'BREAKOP Operate Breaker', 'BREAKOVER Overhaul Breaker', 'INS-PC PC Inspection', 'INS-SUBSYS General Inspection of', 'INS1002 Fire Extinguisher Inspe', 'INS11200 HVAC System Inspect', 'INS11300 Reciprocating Compres', 'INS11460 Burner Gas Fired Inspe', 'INS12100 Electric Cart/Forklift Ins', and 'INS12200 Overhead Crane Inspe'.

An Impact Plan may be Manually Associated in a Single Step

The screenshot displays the 'Work Order Tracking (Nuc)' interface. On the left, a 'Change Status' menu is open, with 'Impact Plan Content' selected. A context menu is also visible, with 'Add/Select Impact Plan' highlighted by a red arrow. The main window shows a 'Select Impact Plan' dialog box with a search field containing '1010' and a table of impact plans.

Select Impact Plan Dialog:

- Impact Plan: 1010
- Unit: [Empty]
- Impact Plan Modes: [Empty]
- Radio buttons:
 - Show All Impact Plans
 - Show Impact Plans for the Location or Asset of the Current Work Order
 - Show Impact Plans for the Job Plan of the Current Work Order
- Refresh button

Select Impact Plan Table:

<input type="checkbox"/>	Impact Plan	Description	Type	Job Plan	Location	Asset	Site	Unit
<input type="checkbox"/>	IPH7	- a nuclear impact plan record	TEMPLATE	JP1000	DEMOMELOX		BEDFORD	
<input type="checkbox"/>	IPD2	- a nuclear impact plan record	TEMPLATE				BEDFORD	
<input type="checkbox"/>	TEST1	Test Permit Line doubling during PM	TEMPLATE				BEDFORD	
<input type="checkbox"/>	1004	Test Permit Line doubling during PM	WORKING				BEDFORD	
<input type="checkbox"/>	1005	Test Permit Line doubling during PM	WORKING				BEDFORD	
<input type="checkbox"/>	1007	- a nuclear impact plan record	WORKING	JP1000	DEMOMELOX		BEDFORD	
<input type="checkbox"/>	1008		WORKING	INS11200	DEMOMELOX		BEDFORD	

Below the table, a note states: "A single impact plan may be selected to create or update a new or existing record. Proceeding without a selection will create an impact plan without any preexisting information." OK and Cancel buttons are at the bottom right.

Context Menu:

- Add/Select Impact Plan
- Add/Select Operational Impacts
- Add/Select Maintenance Impacts
- Remove Operational Impact
- Remove Maintenance Impact

Added a 1:1 Association of Impact Plan to PM, for Use during PMWOGEN

Preventive Maintenance (NUC) Guidelines (1) Go IO Reports Start Center Profile Sign Out Help IBM

Find: Select Action # Save Undo Redo Print

List PM Frequency Seasonal Dates Job Plan Sequence PM Hierarchy Surveillance References Forecast

PM: 1012 Breaker maintenance Site: BEDFORD Status: DRAFT Part of PM Sequence?

Unit: Plant System: Forecast Exists?

Location: Storerroom:

Asset: BREAKER100 Substation Breaker 1001 Gulfstream Storerroom Site: BEDFORD

Job Plan: BREAKINSP Breaker Inspection

Job Plan Sequence Filter 1 - 3 of 3 Download

Job Plan	Description	Sequence	Frequency	Clearance	Clearance Description	Impact Plan
BREAKINSP	Breaker Inspection	1				
BREAKOP	Operate Breaker	12				
BREAKOVER	Overhaul Breaker	48				

Details

Job Plan: BREAKINSP Breaker Inspection Sequence: 1

Clearance: Clearance Required?

Impact Plan: Impact Plan Required?

Impact Plan Manually Selected?

You entered: true

If you activate the setting for manual selection of an impact plan, you must manually specify an impact plan for use with this job plan. If you do not specify an impact plan, the system will not generate a working impact plan during PM work order generation even if a suitable match is found. Do you want to continue? (BMXAK0390)

Yes Cancel

New Row

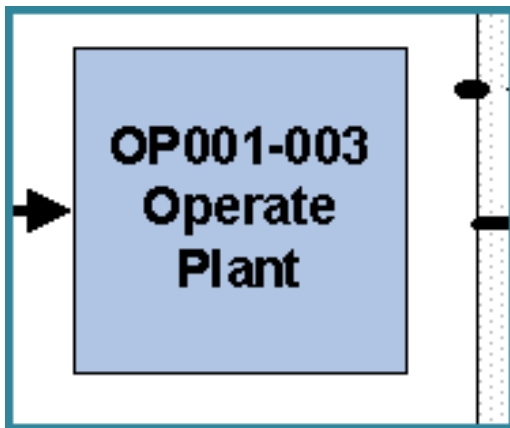
Support for Multiple Permit Generation Options from the Impact Plan

The screenshot displays the 'Work Order Tracking (Nuc)' application interface. A 'Select Value' dialog box is open, showing a list of permit types. A red arrow points from the 'RADTR' entry in the dialog to the 'Permit Type' field in the form below.

Type	Description	Organization
		FUQING
RWP	Radiation Work Permit	FUQING
CHMUS	Chemical Use Permit	FUQING
FRIMP	Fire Imparement Permit	FUQING
HEATS	Heat Stress Permit	FUQING
EXCAV	Ground Excavation Permit	FUQING
RADTR	Radioactive Material Offsite Transportation Permit	FUQING
RADWS	Radioactive Waste Discharge Permit	FUQING
HTWRK	Hot Work Permit	FUQING
SCAFF	Scaffold Permit	FUQING
CNFSP	Confined Space Permit	FUQING

The background application shows a 'Permits' table with columns for Order, Permit Type, and Job Plan. Below the table is a form with fields for Order (10), Permit Type, Permit Generation Mode, Job Plan, Location, and Asset. To the right, there are fields for Permit, Permit Status, Permit Note, Classification, Class Description, and Attachments.

- * Clearances
- * Lineups
- * Operator Logs
- * Equipment Rounds
- * Shift Turnover
- * Objectives
- * Notifications



Clearances Features 1 of 3

- Full Clearance lifecycle – provide for personnel and equipment safety, plant configuration control within Clearance boundary, and management / accountability
- Multiple Clearance Types
 - Working CL
 - Admin CL
 - Template CL
- Multiple Tag Types
 - Danger Tag
 - Test Tag
 - Ground Tag
 - Caution Tag
 - No Tag
- Full integration with MAXIMO Work Orders
 - A WO-Centric View of Clearances for Maintenance
 - One or multiple WOs may be associated with one or multiple Clearances
 - Maintenance acceptance of CL prior to initial work; acceptance of Clearance revisions; and full sign on, sign off, and protected work completion tracking
 - Clearances may be grouped into FECS along with Maximo WOs, PMs, and Permits
- Tag Sharing: one tag per component, and Maximo tracks the Clearance and WOs

Clearance Features

2 of 3

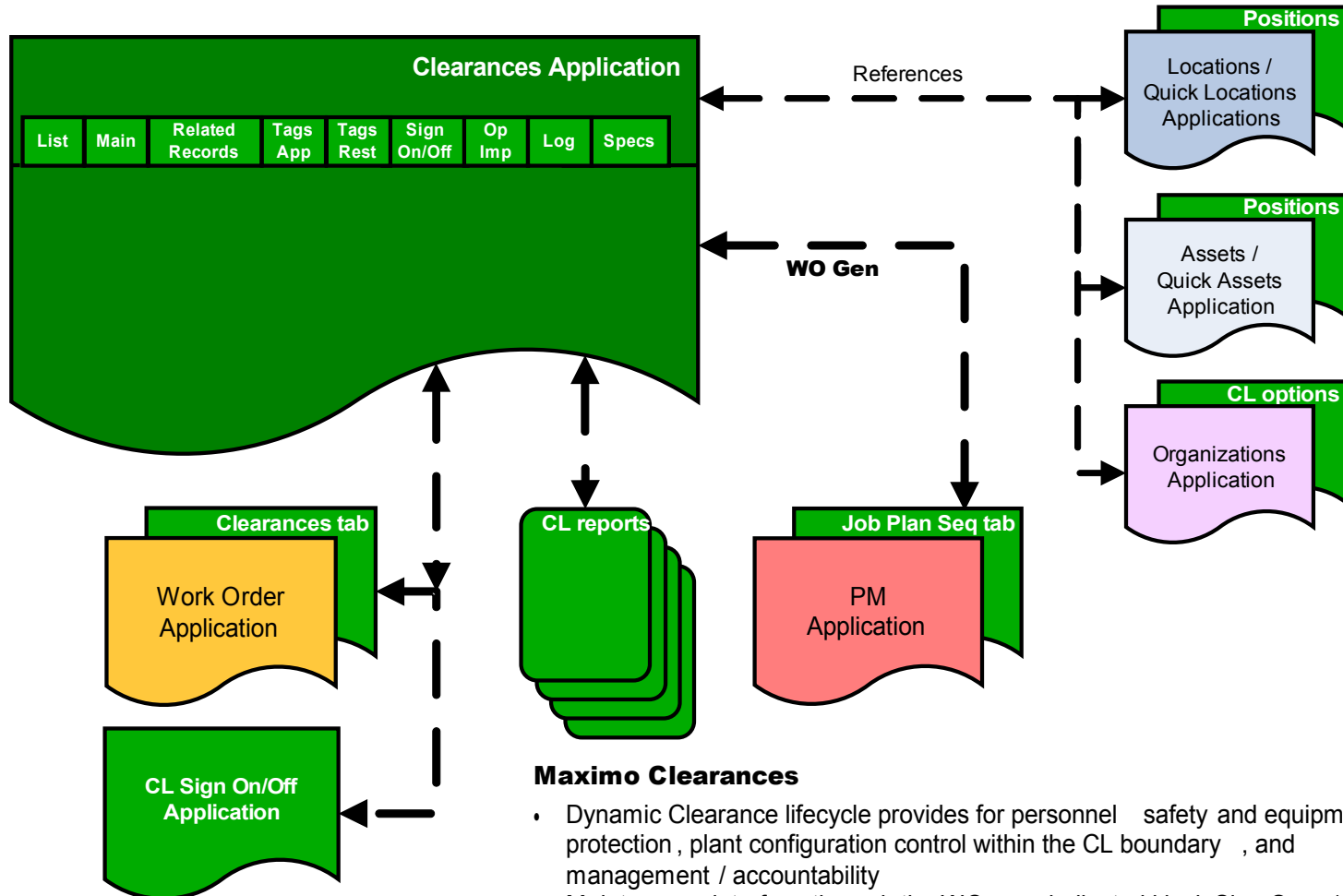
- Template Clearances permit generating the applicable Clearances with their PM WOs
 - Advanced PM grouping and generation options
- Duplicate Clearance functionality provides for easy Clearance boundary reuse
- Conflict Check functionality avoids field surprise
- Revision lifecycle provides full control and efficient response to work changes
 - Supports, for example, Partial Release for component testing
 - Boundary Equipment Groups associated with tagged components facilitate rapid sorting of Tags for release and support of preplanned evolutions
- Flexibility in adding and removing Work Orders to the Clearance protection
 - Groups of WOs may also be transferred to alternate Clearances
- Quick Locations and Quick Assets permit controlled but rapid creation of components when needed for tagging or other operational requirements
 - Quick components may later receive additional approvals, and enter the full nuclear Configuration Change Management process
- System Clearances are supported by a Parent/Child Clearance hierarchy
- Ops ability to Block WOs at any time, including during Clearance revision
 - Flexible Clearance access control

Clearance Features

3 of 3

- Approved component positions for tag restorations may be accessed from Maximo Lineups and brought to the Clearance as part of the restoration process
 - Putting automation to work in support of improved human performance
- Clearance actual positioning is recognized in Maximo Lineups for crediting by the SRO
 - Optimize plant startup critical path activities
- Dedicated kiosk-style application for Sign On/Off
 - Provides rapid access for multiple personnel to Clearance protection without changing Maximo user
- Dedicated kiosk-style application for hanging and removing tags in the field
 - Supports operations field tasks with rapid access
- MAXVAR control of Clearance capabilities map to US and worldwide processes
- Undo feature builds in controlled and fully accountable flexibility where warranted
- Clearance standard reports support use:
 - Standard reports for managing a single Clearance
 - Clearances Tag Print
 - Clearance Configuration Change Order report
 - Clearance Configuration IV Order report
 - Standard reports for plant-wide management of the complete Clearances business cycle
 - Clearances Needed report
 - Open Clearances Index report
 - Tags in the Field report
 - Work Against Tagged Components report
 - Clearances Ready to Release report

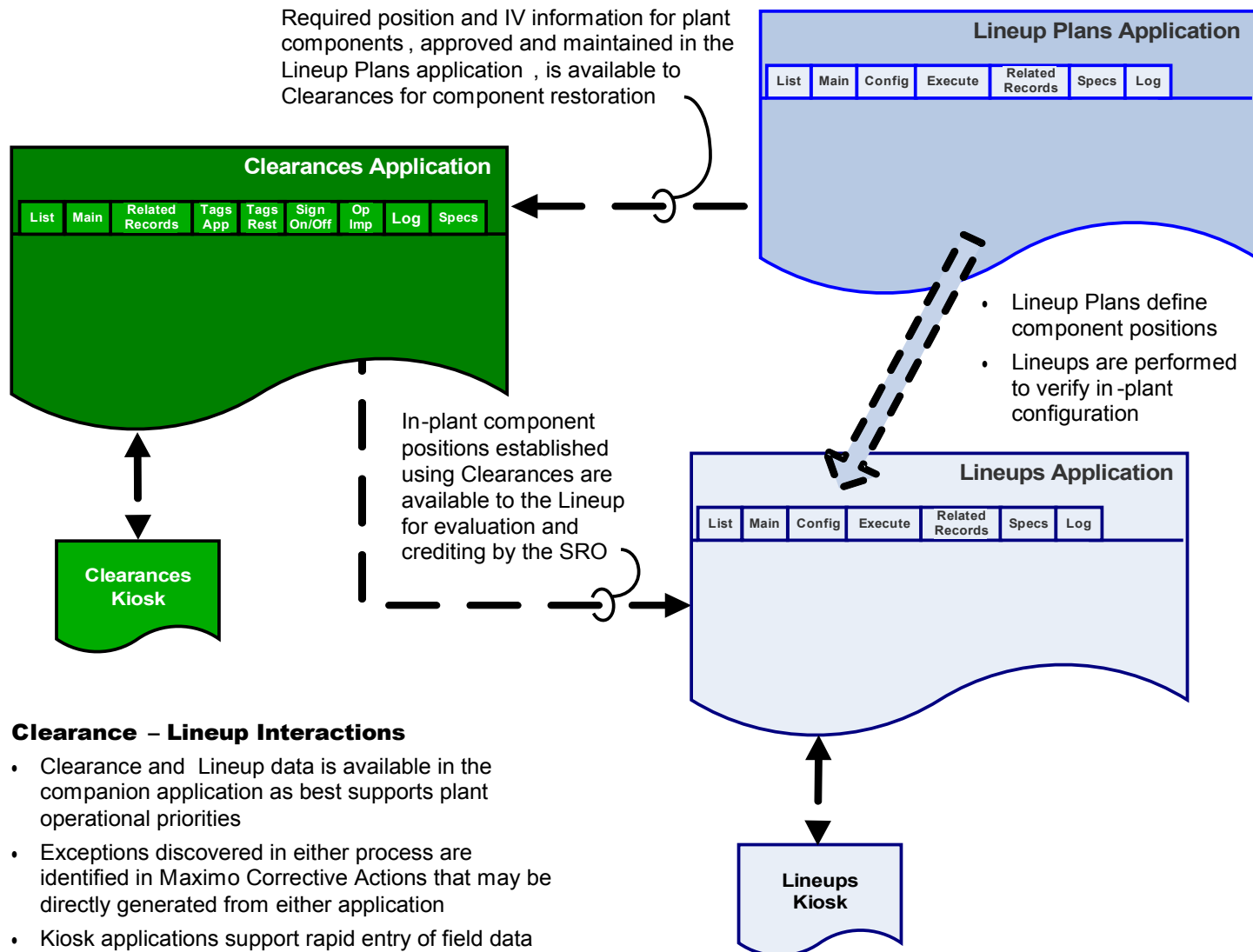
Clearances Schema



Maximo Clearances

- Dynamic Clearance lifecycle provides for personnel safety and equipment protection, plant configuration control within the CL boundary, and management / accountability
- Maintenance interface through the WO or a dedicated kiosk Sign On / Sign Off application
- Advanced features : Tag Sharing; Template CLs for PMs; Parent/Child CL hierarchies; multiple CL Types; multiple Tag Types; Op Impacts identified; Conflict Checking

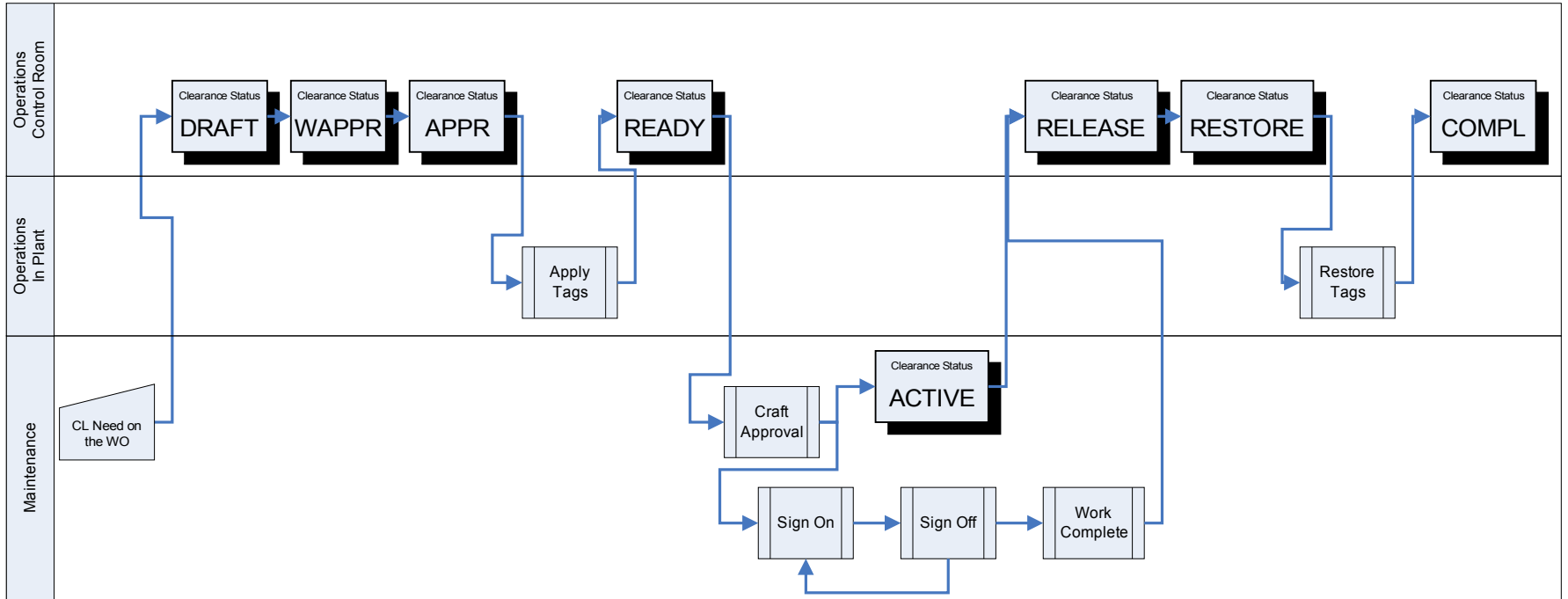
Interactions between Clearances, Lineup Plans, and Lineups



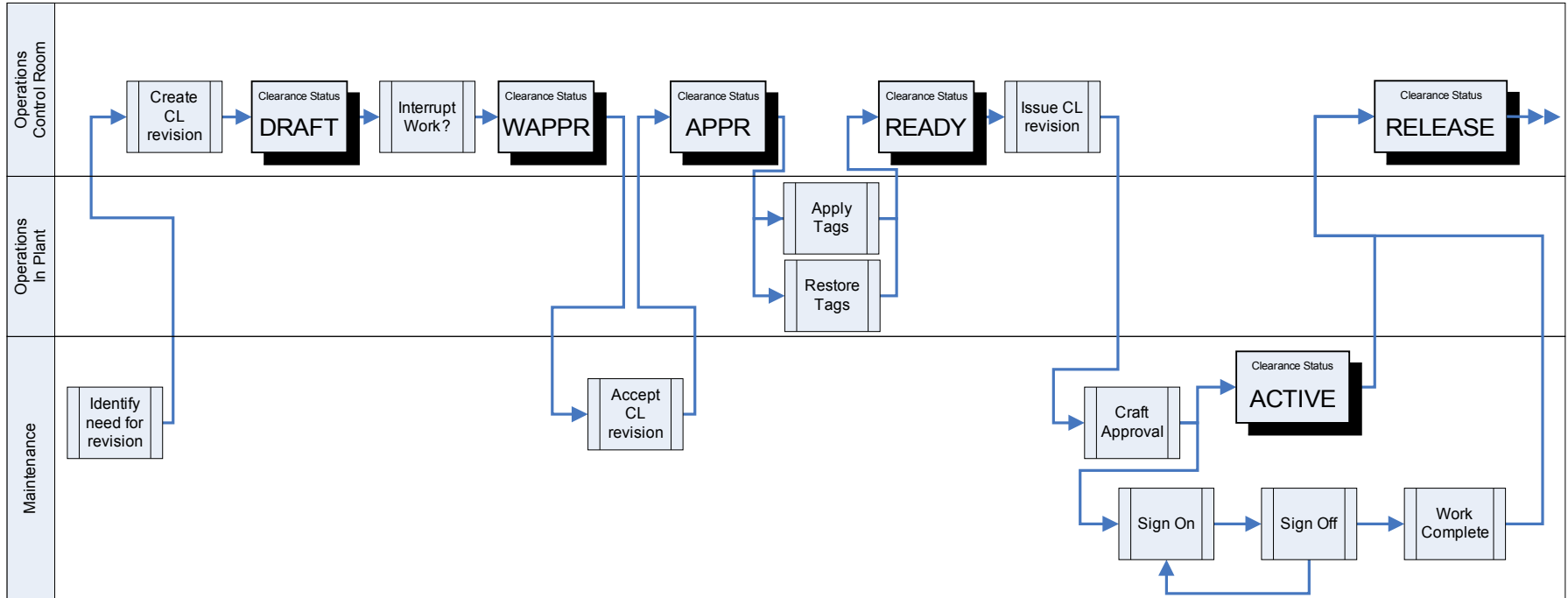
Clearance – Lineup Interactions

- Clearance and Lineup data is available in the companion application as best supports plant operational priorities
- Exceptions discovered in either process are identified in Maximo Corrective Actions that may be directly generated from either application
- Kiosk applications support rapid entry of field data

Business Process: Basic Clearance Lifecycle

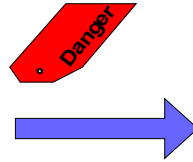


Business Process: Clearance Revision



Clearance Tag Lifecycle and Tag Status

Preparing to reposition the component and hang the tag.



Tag status = **DRAFT**

The component is tagged and under Clearance control. Maintenance work can safely proceed.



Tag status = **APPLIED**

Preparing to remove the tag and restore component position.



Tag status = **PENDING**

The component is no longer tagged nor under Clearance control.



Tag status = **RESTORED**

Clearances – Main Tab

Clearances (Huc)

 Bulletins: (0) [Go To](#) [Reports](#) [Start Center](#) [Profile](#) [Sign Out](#) [Help](#)

Find:
Select Action

List Clearance Related Records Application Restoration Sign On/Off Operational Impacts Log Specifications

Clearance: <input type="text" value="1003"/>	Clearance, CHECKLIST	Site: <input type="text" value="BEDFORD"/>	Status: <input type="text" value="APPR"/>
Location: <input type="text" value="2-PUMP"/>	Unit2, RHR A Pump	Unit: <input type="text" value="UNIT 2"/>	Status Date: <input type="text" value="8/13/12 2:09 PM"/>
Asset: <input type="text"/>		Plant System: <input type="text" value="RHEATREMF"/>	Tag Share Run? <input checked="" type="checkbox"/>
Equipment Group: <input type="text" value="RHR 100"/>	RHR Group 100	Type: <input type="text" value="WORKING"/>	Tag Share Date: <input type="text" value="8/13/12 2:16 PM"/>
Parent: <input type="text"/>		Template: <input type="text"/>	Attachments
Revision: <input type="text"/>			Classification: <input type="text" value="CLEARANCES \ BOUNDARY_RQST"/>
Parent Under Rev? <input type="checkbox"/>			Class Description: <input type="text" value="Boundary Request"/>

Responsibility

Created By:

Created Date:

Changed By:

Changed Date:

Revision Information

Revision:

Active?

Revised By:

Issued By:

Revision Date:

Issue Date:

Comments:

Scheduling Information

Target App. Start: <input type="text" value="8/13/12 12:00 PM"/>	Target Rest. Start: <input type="text" value="8/14/12 2:00 PM"/>
Target App. Finish: <input type="text" value="8/13/12 2:30 PM"/>	Target Rest. Finish: <input type="text" value="8/14/12 4:00 PM"/>
Scheduled App Start: <input type="text" value="8/13/12 12:00 PM"/>	Scheduled Rest Start: <input type="text" value="8/14/12 2:00 PM"/>
Scheduled App Finish: <input type="text" value="8/13/12 2:30 PM"/>	Scheduled Rest Finish: <input type="text" value="8/14/12 4:00 PM"/>
Actual App Start: <input type="text" value="8/13/12 2:09 PM"/>	Actual Rest Start: <input type="text"/>
Actual App Finish: <input type="text"/>	Actual Rest Finish: <input type="text"/>

Tags

Danger Tags:	5
Grounding Tags:	0
Test Tags:	0
Caution Tags:	0
No Tags:	0
Total Tags:	5

Clearances – Related Records Tab

Clearances (HUC) Bulletins (0) Go To Reports Start Center Profile Sign Out Help

Find: Select Action

Clearance: 1003 Clearance,CHECKLIST Site: BEDFORD Revision: 0
 Location: 2-PUMP Unit 2, RHR A Pump Unit: UNIT 2 Active?
 Asset: Plant System: RHEATREMA Status: APPR Type: WORKING

Related Work Orders: Filter 1 - 2 of 2 Download

Work Order	Description	Status	Appr Req for Addition?	Appr Req for Removal?	Pending Acceptance of CL Rev?	Blocked?	Released?
1202	Repair oil leak lower bearing - 2 drops / minute	WAPPR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1203	Vibrations trending upward over past two ISI runs	WAPPR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Select Work Orders New Row

Child Clearances: Filter 0 - 0 of 0 Download

Clearance	Revision	Description	Location	Asset	Status	Type
...No rows to display...						

Select Clearances New Row

Related PMs: Filter 0 - 0 of 0 Download

PM	PM Description	PM Status	Job Plan	Job Plan Description	Job Plan Status	Pending Rev??
...No rows to display...						

Select PM

Related Equipment Groups: Filter 1 - 2 of 2 Download

Equipment Group	Description	Type	Equipment Group Modes	Status
GREEN	Outage Planning FEG	OUTAGE		ACTIVE
RED	Workweek 10 FEG	WORKWEEK	4,5,6	ACTIVE

Select Equipment Groups New Row

Clearances – Application Tab

The screenshot shows the 'Clearances (Nuc)' application interface. The browser title is 'Clearances (Nuc) - Mozilla Firefox'. The address bar shows the URL: localhost/maximo/ui/?event=loadapp&value=pluscl&uisessionid=3&csrftoken=lbdt8jpimu0ajdoonj6qc0vqo7. The application header includes 'Clearances (Nuc)' and navigation links like 'Go To', 'Reports', 'Start Center', 'Profile', 'Sign Out', and 'Help'. Below the header is a search bar and a 'Select Action' dropdown. The main content area has several tabs: 'List', 'Clearance', 'Related Records', 'Application' (selected), 'Restoration', 'Sign On/Off', 'Operational Impacts', 'Log', and 'Specifications'. The 'Application' tab displays details for a clearance with ID 1003, including location (2-PUMP), asset, site (BEDFORD), unit (UNIT 2), and status (ACTIVE). Below the details is a table of tag applications.

App Sequence #	Tag ID	Location	Asset	App Position	Tag Status	Tag Type	Boundary E#	Shared?	Released?	Pending IV?			
	1010	2-CS-PUMP		PTL	APPLIED	DANGER	RHRA-ELEC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
1	1005	2-CB1		RO	APPLIED	DANGER	RHRA-ELEC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
2	1006	2-CB2		RO	APPLIED	DANGER	RHRA-ELEC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
3	1007		F23456	REMOVE	APPLIED	DANGER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
4	1008	2-DISCH		CLOSED	APPLIED	DANGER	RHRA_MECH	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
5	1009	2-SUCT		CLOSED	APPLIED	DANGER	RHRA_MECH	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			

Clearances Kiosk

Clearances Kiosk (Nuc) Bulletins: (0) Go To Reports Start Center Profile Sign Out Help

Select Action User Name: stanley Password: Show Records Clear User

List Tag Data
 Clearance: 1003 Protection boundary - RHR A pump maintenance Site: BEDFORD Active?
 Location: 2-PUMP Unit 2, RHR A Pump Unit: UNIT 2 Revision: 0
 Asset: Unit System: RHEATREM Status: APPR Type: WORKING

Apply Tags Verify Applied Tags
 To add or remove applier details for a tag, select or clear the check box for the relevant table row. For accountability, when you remove applier details, your user name is entered in the Comment field.

Tags	Filter	1 - 5 of 5	Download							
<input type="checkbox"/>		App Sequence #	Tag ID	Location	Asset	Unit	App Position	Tag Status	Applied By	IV By
<input type="checkbox"/>									--NULL--	
<input checked="" type="checkbox"/>	▶	1	1005	2-CB1		UNIT 2	RO	DRAFT	STANLEY	
<input checked="" type="checkbox"/>	▶	2	1006	2-CB2		UNIT 2	RO	DRAFT	STANLEY	
<input checked="" type="checkbox"/>	▶	3	1007		F23466		REMOVE	DRAFT	STANLEY	
<input type="checkbox"/>	▶	4	1008	2-DISCH		UNIT 2	CLOSED	DRAFT		
<input type="checkbox"/>	▶	5	1009	2-SUCT		UNIT 2	CLOSED	DRAFT		


Default Data for Remaining Tags



You can apply the default data to the tags on display that do not have applier details.

Applied By: STANLEY
 Date: 8/13/12 2:10 PM
 Comment: Completed electrical repositioning and tag placement

Apply Default Data





Sign On/Off Facilitates Rapid Technician Access to Clearance Protection



Sign On/Off (Nuc) Bulletins: (0) [Go To](#) [Reports](#) [Start Center](#) [Profile](#) [Sign Out](#) [Help](#) 

Select Action  

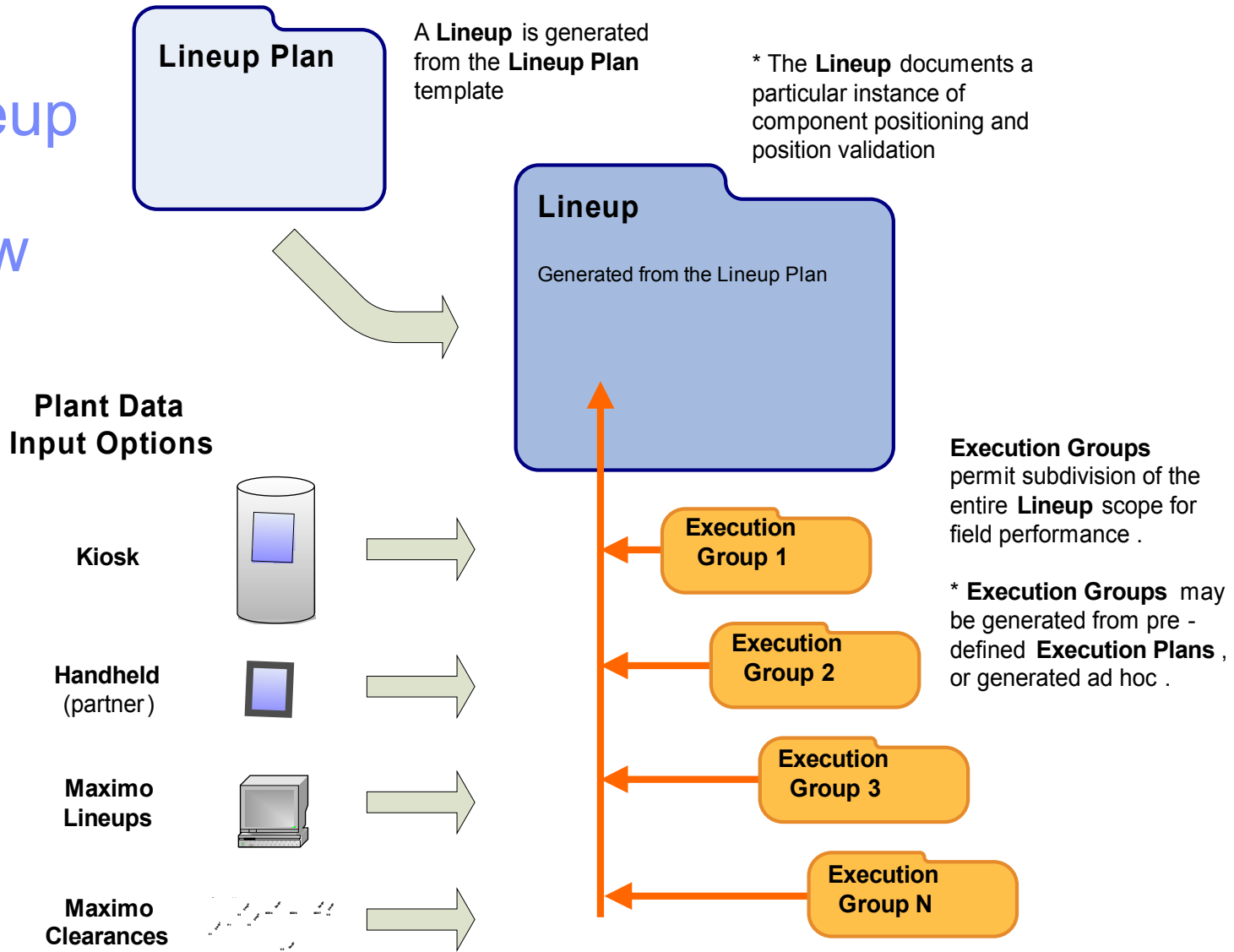
User Name: Password:

[Show Sign OnOff Records](#) [Clear User](#)

Sign Ons for WILSON [Filter](#)    1 - 2 of 2 [Download](#) 

	<u>Work Order</u>	WO Location	WO Asset	<u>Clearance</u>	CL Location	CL Asset	Blocked?	<u>Signed On?</u>	Signed Off?	<u>Work Complete?</u>
	1202	2-PUMP		1003	2-PUMP		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1203	2-PUMP		1003	2-PUMP		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Lineups and Lineup Plans Overview



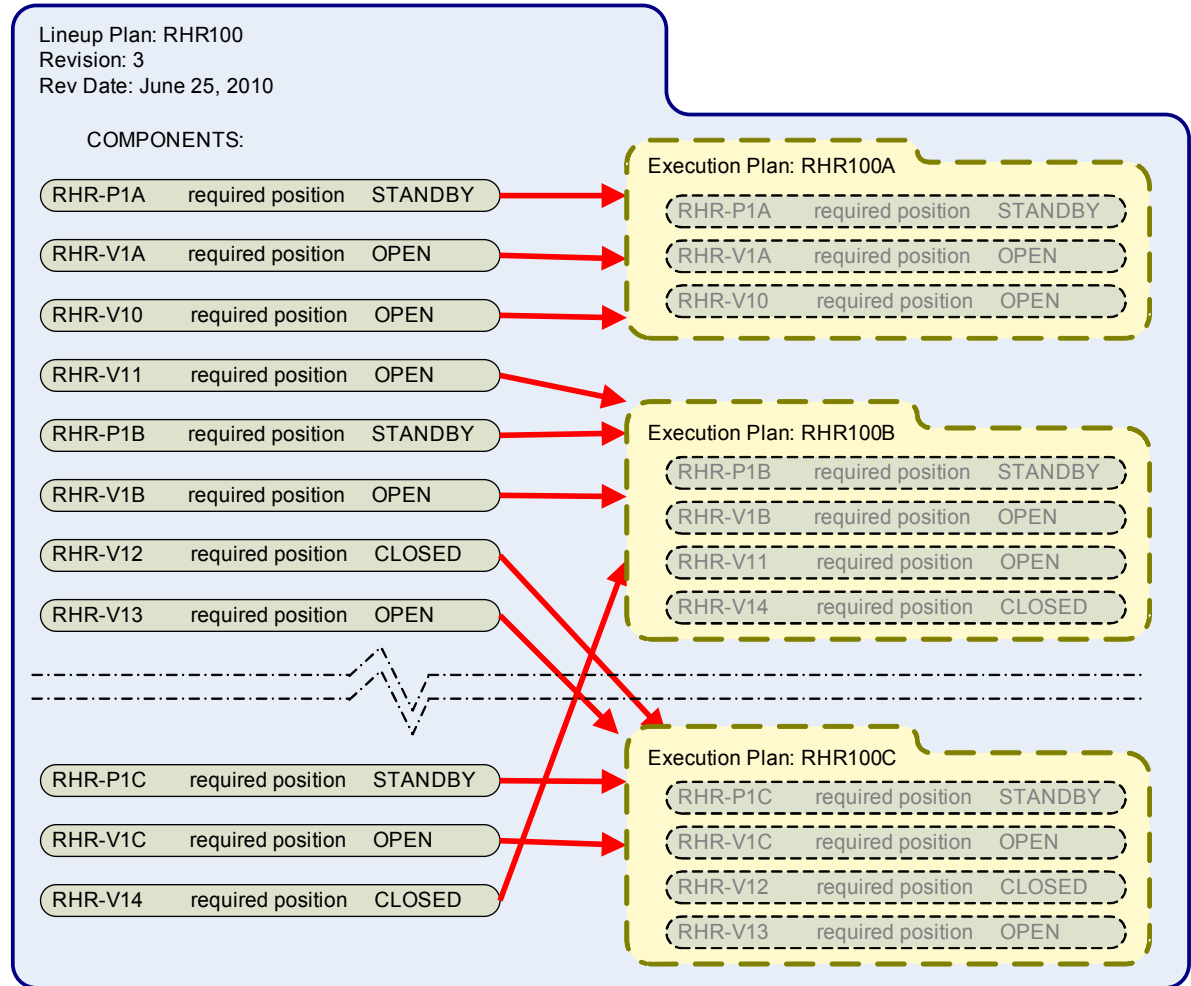
Lineup / Lineup Plans Features

- Lineup Plans hold both the approved plant configurations and operations work management approaches to establish them
 - Configuration Control data is locked down upon approval but execution planning data may be adjusted any time
- Lineup Plan validations “back-up” procedure development process and controls
- Lineup Plans status interlocks allow special lineup conditions, e.g. an approved temporary equipment Lineup, to co-exist unambiguously in the system with the normal Lineup
- Lineup life cycle – supports operational work management processes to facilitate execution of the configuration management plan : Create, Schedule, and Execute
- Lineup Execution Groups are straightforward to generate, and enhance the management of field work
- Lineup positioning events provide Locations and Assets with real time operational history updates
- All process actions can be updated until the Lineup is completed
 - Credit actions from Clearances can be applied and removed
 - Positioning actions can be applied, remove or updated
 - Positioning exceptions can be applied or removed as required
 - Logical controls exist to protect all data input or removal

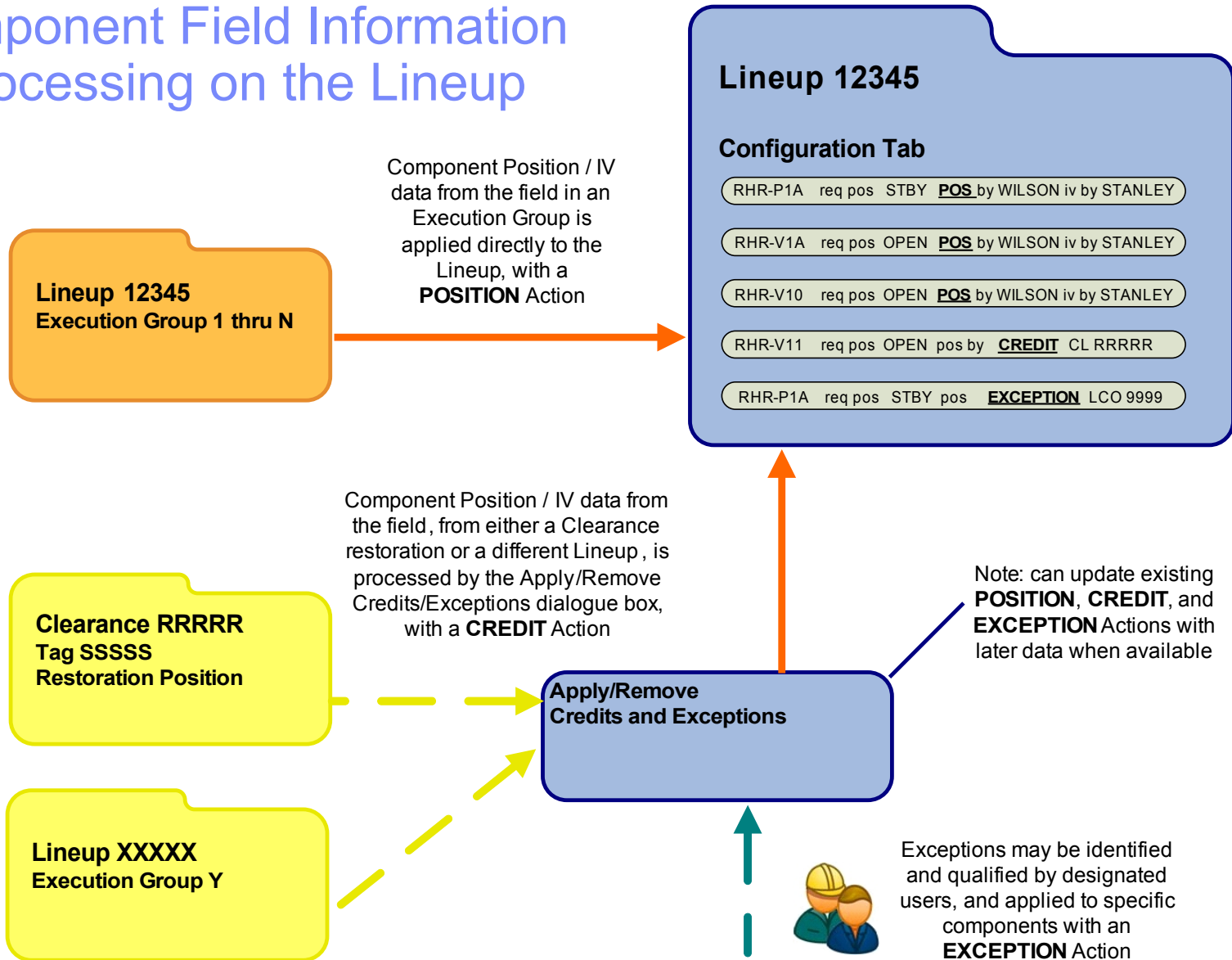
Lineup Plans: Configuration Control “Template”

* Identify plant components and required positions

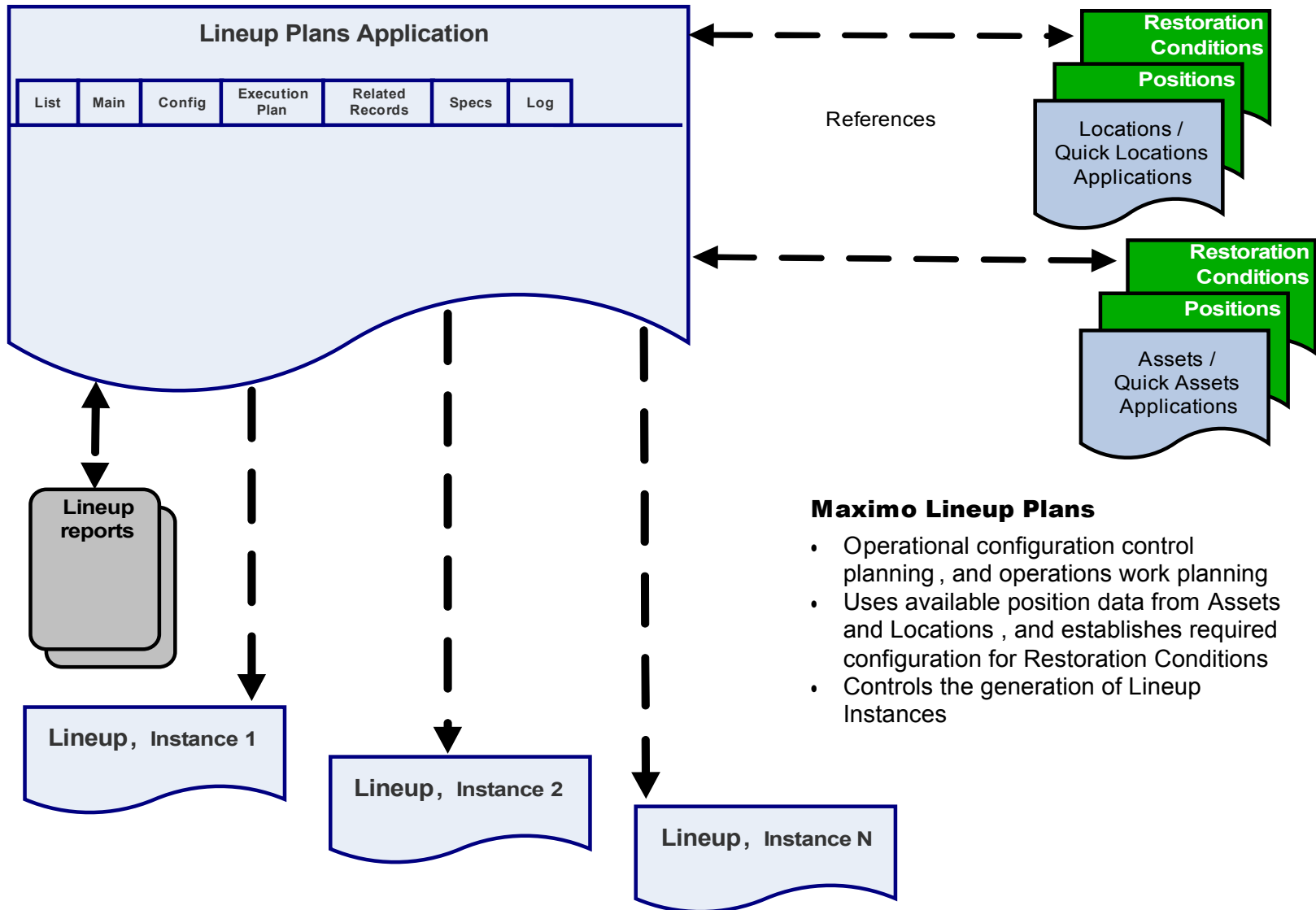
* Establish predefined execution plans



Component Field Information Processing on the Lineup



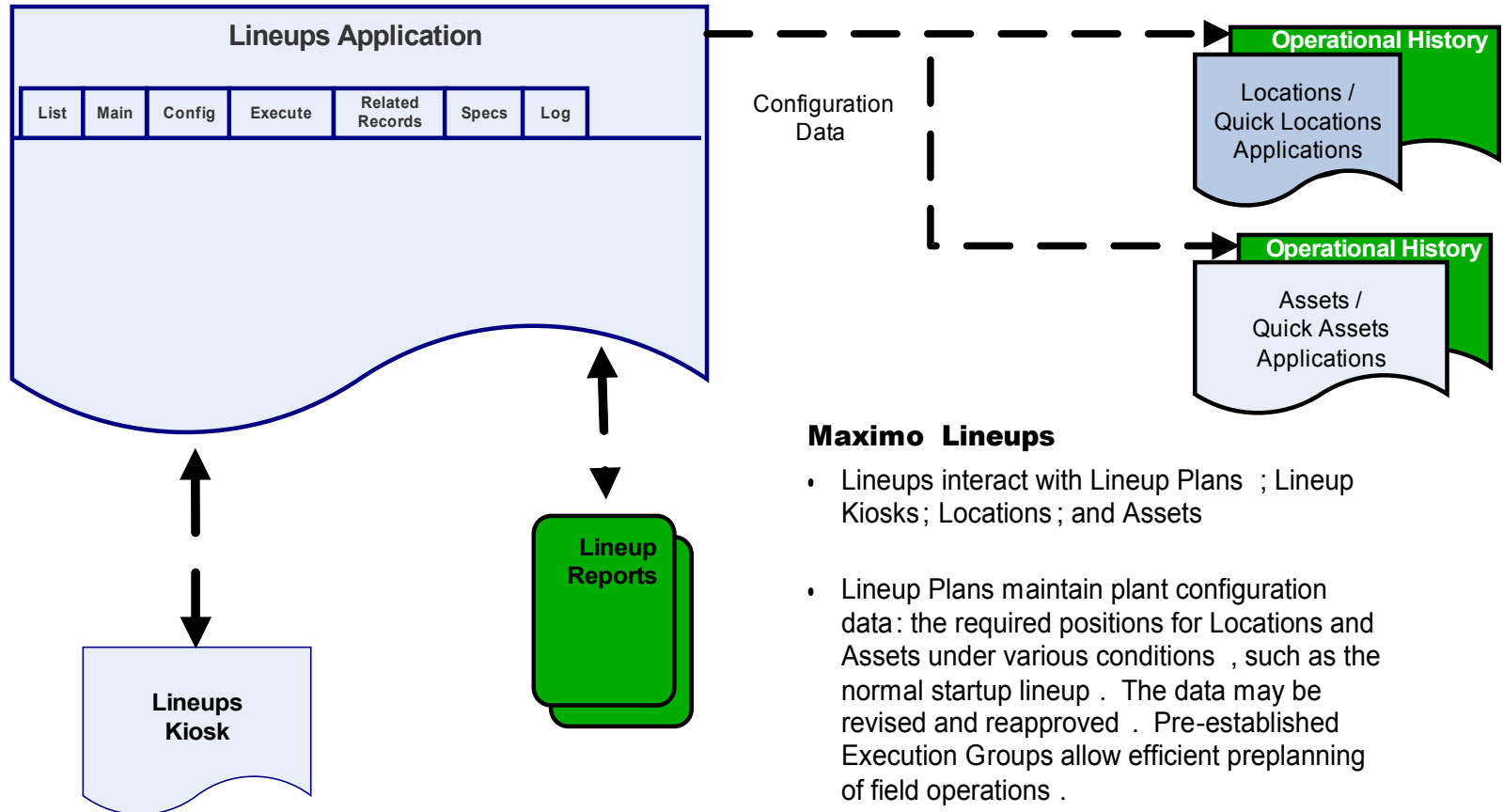
Lineup Plans Schema



Maximo Lineup Plans

- Operational configuration control planning , and operations work planning
- Uses available position data from Assets and Locations , and establishes required configuration for Restoration Conditions
- Controls the generation of Lineup Instances

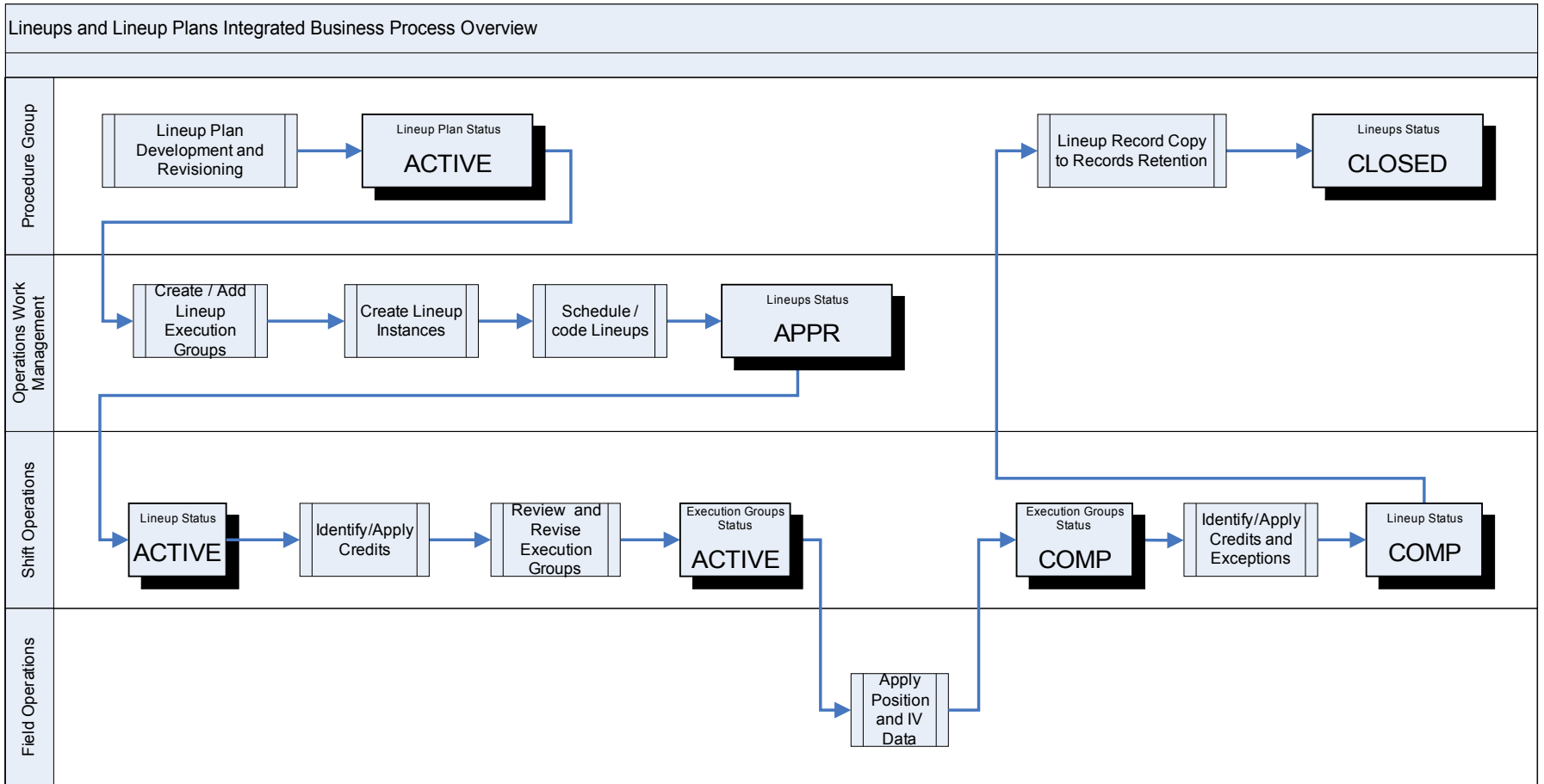
Lineups Schema



Maximo Lineups

- Lineups interact with Lineup Plans ; Lineup Kiosks; Locations; and Assets
- Lineup Plans maintain plant configuration data : the required positions for Locations and Assets under various conditions , such as the normal startup lineup . The data may be revised and reapproved . Pre-established Execution Groups allow efficient preplanning of field operations .
- Lineups manage and record plant configuration data based on field validation .
- The Lineups Kiosk application is a simple and efficient method for entering field data .

Business Process: Lineups

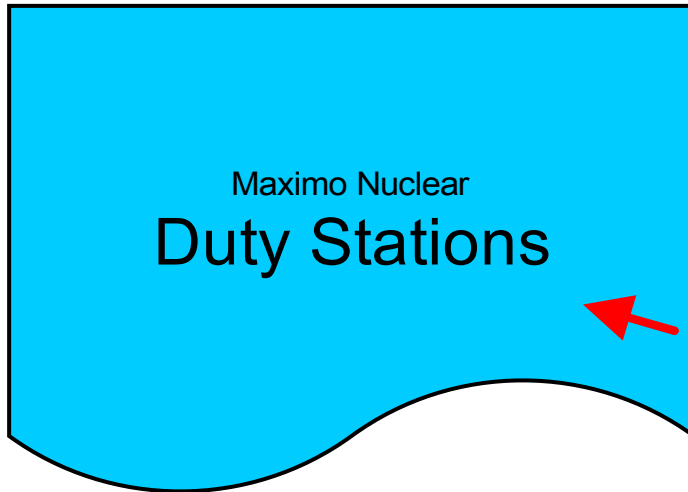


Operational History Foundations in Maximo Nuclear

- Significant benefits accrue from capturing not only the current operational configuration of components, but also their history and the process which established or declared that state
 - Configuration control
 - Logging requirements
 - Compliance validation
 - Integration with other plant software

- Assets and Locations have been modified to capture their operational history
 - Clearances input to operational history as components are tagged and restored
 - Lineup input to operational history as components are positioned
 - Capture operational status or positioning statements from operator logs e.g. START, STOP, AVAILABLE, CLOSED, OPEN
 - (Future - roadmap enhancement) Capture operability statements from LCO Tracking e.g. OPERABLE, INOPERABLE

Duty Stations Support the Multiple Needs of Watchstanders



Accept a turn over, take the shift; turn over to the relieving shift

Identify Shift team members and status

Track and manage plant status information

Monitor Condition Reports requiring Ops Shift Review

Capture narrative information pertinent to shift responsibilities, and follow-up

Indicate changes to the operational condition of specific plant equipment

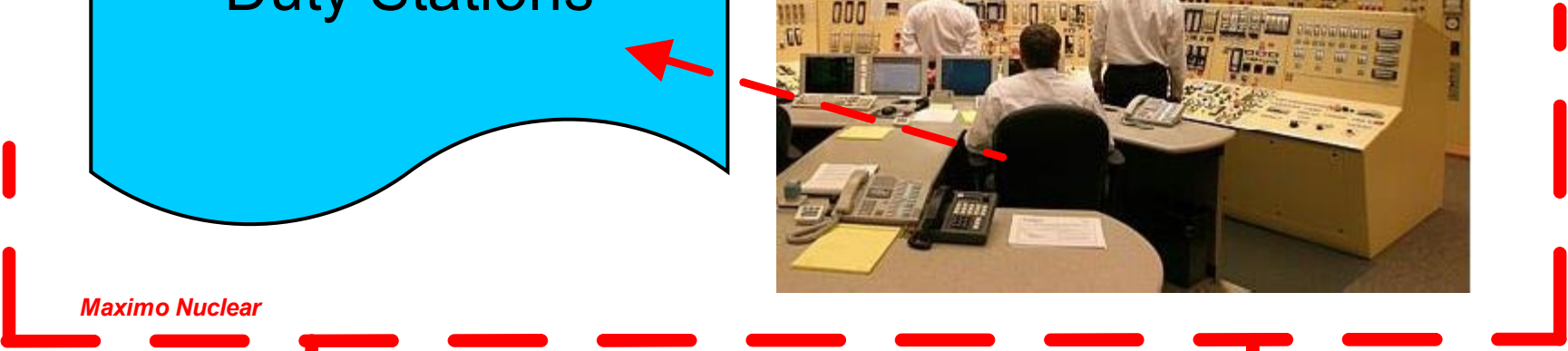
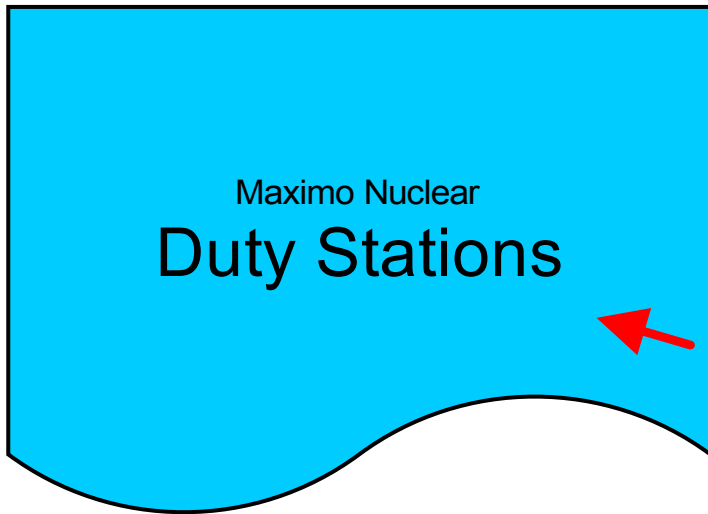
Monitor LCO Actions that are becoming due

Perform equipment rounds and short term surveillances

Record progress achieving operational objectives assigned by management

Update and track compliance with required reading and shift qualification tasks

The Duty Stations Framework



Maximo Nuclear

Fully configurable creation of Duty Stations for any position, or plant mode; supports Ops in the Main Control Room, and plant; also duty HP; I&C: Outage Management; Test Director; and other positions . . .

Manage compliance with required watchstander Qualifications

Duty Stations is enabled by new Maximo Nuclear apps Duty Station Plans; Objectives; Notifications; and Reading Frequency. Also ties to Locations, Assets, Meters, Condition Monitoring, and Surveillance Requirements

Duty Stations (Nuc)

- Manages each Position's Shift record
 - Narrative Log entries including open logs, follow-ups and corrections
 - Allows one-button creation of CRs from individual log entries
 - May be keyed to equipment operational status change
 - Perform equipment rounds and short term surveillances
 - In addition, an On-Demand readings process is available
 - Turnover Process with Log review
 - Presentation of Plant Status; Objectives with acknowledgement; Active LCOs; and CRs with their review status
 - Provides watch stander with required reading review and acknowledgment process

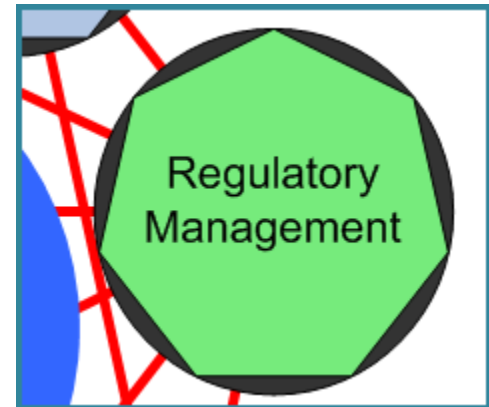
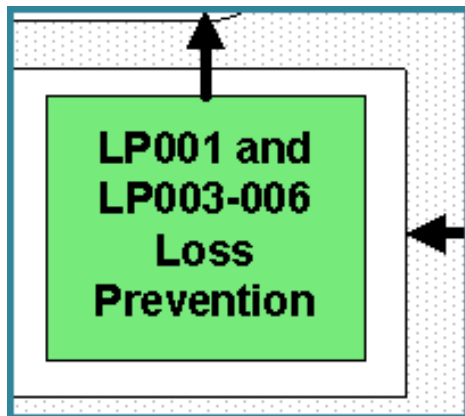
Duty Station Plans (Nuc)

- Allows configurations of all Positions needed to satisfy plant watch-standing requirements. Applicable to all plant modes. Also provides for non-routine / alternate round requirements caused by temporary or OOS equipment
 - Defines applicable equipment list for status monitoring
 - Defines display and editability rules, log review hierarchy, and shift turnover details
 - Defines scope of routine readings, observations, and turnover support
 - Defines management of
 - Plant Status
 - Plant Objectives

Related Apps

- Core Maximo Meters and Condition Monitoring
 - Uses existing Maximo framework, with additional capability to preserve the integrity of the Rounds reading process
- Objectives (Nuc)
 - Provides management of station objectives beyond routine Duty Station watch-standing requirements
- Notifications (Nuc)
 - Creates the Required Review records and assigns users to those items
- Links to Surveillances (Nuc) to define equipment surveillance requirements
- Assets and Locations (Nuc) to capture Operational History input from Duty Stations
- Reading Frequencies (Nuc) to defines when readings are taken during a Duty Station's Rounds

- * Tech Specs / Regulations
- * LCO Tracking / Regulatory Compliance
- * Commitment Tracking



Tech Specs – Main Tab

Tech Specs (Nuc) Bulletins: (0) Go To Reports Start Center Profile Sign Out Help

Find: Select Action

The tech spec record provides information about an LCO (limiting condition for operation) or equivalent regulation that is documented externally. Key values in the tech spec record, including the regulation identifier, revision, and applicability, are copied from the source document.

Tech Spec:
 Revision:

Type:
 Status:

Applicability:
 Site:

Tech Spec Note:
 Unit:

Actions Note:
 Tech Spec Modes:

Source Revision:
 Mode Entry Requirement:

Source Revision Date:
 Attachments:

Actions: 1 - 4 of 4 Download

The Actions table shows a list of conditions that do not comply with regulatory requirements and the actions that are required to achieve compliance. The source details for each action are copied from the source document. Operational details are defined by the tech spec record owner based on the prescribed completion time.

Condition	Condition Description	Action	Action Description	Completion Time
A.	RCIC System inoperable	A.1	Verify by administrative means High Pressure Core Spr	Immediately
A.	RCIC System inoperable	A.2	Restore RCIC System to OPERABLE status	14 days
B.	Action and associated Completion Time not met.	B.1	Be in MODE 3.	12 hours
B.	Action and associated Completion Time not met.	B.2	Reduce reactor steam dome pressure to =< [150] psig.	36 hours

Surveillance Requirements: 1 - 5 of 5 Download

Surveillance Requirement	Description	Type	Frequency	Status	Site	Unit
SR 3.5.3.1	Verify the RCIC System piping is filled with water from	TS	31 days	ACTIVE	BEDFORD	UNIT 2
SR 3.5.3.2	Verify each RCIC System manual, power operated, and	TS	31 days	ACTIVE	BEDFORD	UNIT 2
SR 3.5.3.3	Verify, with RCIC steam supply pressure <= 1046 psig :	TS	92 days	ACTIVE	BEDFORD	UNIT 2
SR 3.5.3.4	Verify, with RCIC steam supply pressure <= 165 psig, tl	TS	18 months	ACTIVE	BEDFORD	UNIT 2
SR 3.5.3.5	Verify the RCIC System actuates on an actual or simul	TS	18 months	ACTIVE	BEDFORD	UNIT 2

Tech Specs – Related Records Tab

Tech Specs (Nuc) Bulletins: (0) Go To Reports Start Center Profile Sign Out Help IBM

Find: Select Action

List Tech Spec **Related Records** Bases

Tech Spec: 3.5.3 RCIC System Site: BEDFORD Status: ACTIVE
 Type: TS Plant Technical Specifications Unit: UNIT 2 Attachments

Related Tech Specs Filter 1 - 1 of 1 Download

Tech_Spec	Description	Type	Unit	Applicability
TEST01	RCIC System	TS	UNIT 2	Applicability

Select Tech Specs

Associated Locations Filter 1 - 2 of 2 Download

The association between a location and tech spec record supports quick identification of locations that might be affected when plant conditions do not comply with regulations. The association also supports quick identification of regulatory requirements when the location is subject to maintenance or test activities.

Location	Description	Site	Unit	Plant System
BR430	Condensate Return Pump- Centrifugal/100GPM/60FTHC	BEDFORD	UNIT 2	RCIC
COMPST1	Compressor Station 1	BEDFORD	UNIT 2	RCIC

Select Locations

Tech Specs – Bases Tab

The screenshot displays the 'Tech Specs (Nuc)' application window. At the top, there is a navigation bar with 'Bulletins: (0)', 'Go To', 'Reports', 'Start Center', 'Profile', 'Sign Out', and 'Help'. Below this is a search bar with 'Find:' and a 'Select Action' dropdown. The main interface has tabs for 'List', 'Tech Spec', 'Related Records', and 'Bases', with 'Bases' currently selected.

A message states: "A bases topic exists for each LCO. The bases topic identifier, revision details, and topic text are copied from the source document." Below this, several fields are populated:

- Tech Spec: 3.5.3
- RCIC System
- Site: BEDFORD
- Status: ACTIVE
- Type: TS
- Plant Technical Specifications
- Unit: UNIT 2
- Attachments
- Bases Topic: B 3.5.3
- RCIC System
- Bases Topic Revision: 3.0
- Revision Date: 03/31/04

The 'Bases Topic Text:' section contains a rich text editor with the following text:

BACKGROUND

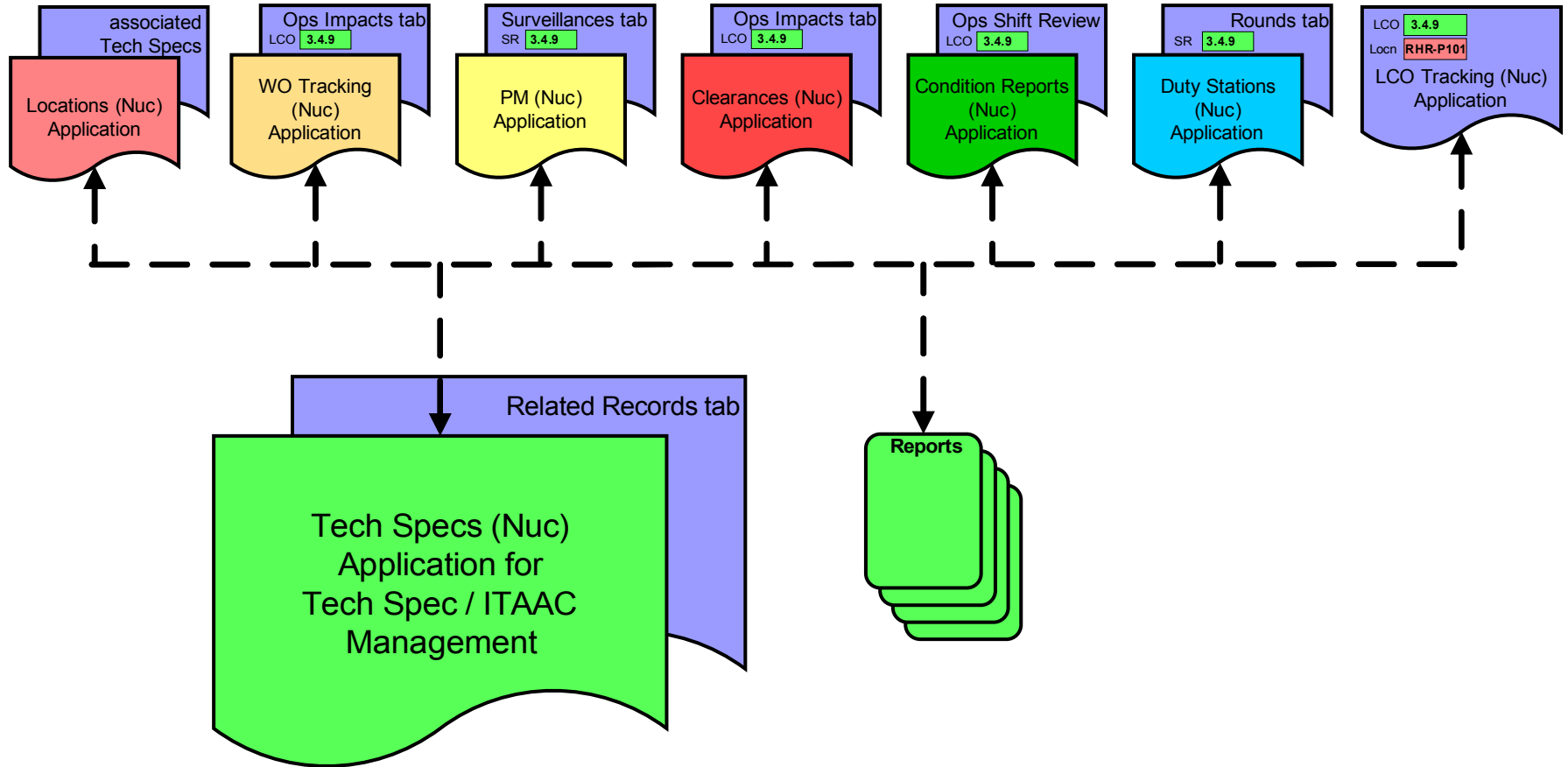
The RCIC System is not part of the ECCS; however, the RCIC System is included with the ECCS section because of their similar functions. The RCIC System is designed to operate either automatically or manually following reactor pressure vessel (RPV) isolation accompanied by a loss of coolant flow from the feedwater system to provide adequate core cooling and control of RPV water level. Under these conditions, the High Pressure Core Spray (HPCS) and RCIC systems perform similar functions. The RCIC System design requirements ensure that the criteria of Reference 1 are satisfied.

The RCIC System (Ref. 2) consists of a steam driven turbine pump unit, piping, and valves to provide steam to the turbine, as well as piping and valves to transfer water from the suction source to the core via the feedwater system line. Suction piping is provided from the condensate storage tank (CST) and the suppression pool. Pump suction is normally aligned to the CST to minimize injection of suppression pool water into the RPV. However, if the CST water supply is low, or the suppression pool level is high, an automatic transfer to the suppression pool water source ensures a water supply for continuous operation of the RCIC System. The steam supply to the turbine is piped from main steam line A, upstream of the inboard main steam line isolation valve.

The RCIC System is designed to provide core cooling for a wide range of reactor pressures, [165] psig to [1155] psig. Upon receipt of an initiation signal, the RCIC turbine accelerates to a specified speed. As the RCIC flow increases, the turbine control valve is automatically adjusted to maintain design flow. Exhaust steam from the RCIC turbine is discharged to the suppression pool. A full flow test line is provided to route water from and to the CST to allow testing of the RCIC System during normal operation without injecting water into the RPV.

The RCIC pump is provided with a minimum flow bypass line, which discharges to the suppression pool. The valve in this line automatically opens to prevent pump damage due to overheating when other discharge line valves are closed. To ensure rapid delivery of water to the RPV and

The Tech Specs / ITAAC Framework Supports Logical Associations and Effective Integration of Key Processes



Example: Locations, WOs, PMs, CLs (shown), CRs, and Duty Stations May All Be Related to Tech Specs

Clearances (Nuc) Bulletins: (0) Go To Reports Start Center Profile Sign Out Help

Find: Select Action [Icons]

Clearance: 1003 Troubleshoot and repair pump Site: BEDFORD Revision: 2
 Location: 2-PUMP Unit 2, RHR A Pump Unit: UNIT 2 Active?
 Asset: Plant System: RHEATREMK Status: ACTIVE
 Type: WORKING

Tech Spec Applicability

Tech Specs Applicable? Tech Specs Comments: Enter LCO when pump CB is tripped

Technical Specifications Filter > 1 - 2 of 2 > Download

Tech Spec	Description	Type	Unit	Applicability
3.5.3	RCIC System	TS	UNIT 2	MODE 1. MODES 2 and 3 with reactor steam dome pres
TEST01	Test Tech Spec 01	TS	UNIT 2	Applicability

Details

Tech Spec: 3.5.3 RCIC System Attachments
 Type: TS Plant Technical Specifications Tech Spec Note: n/a
 Unit: UNIT 2
 Applicability: MODE 1. MODES 2 and 3 with reactor steam dome pres

Unavailability Components Filter > 1 - 1 of 1 > Download

Location	Description	Asset	Description	Unit	PRA?
2-PUMP	Unit 2, RHR A Pump			UNIT 2	<input checked="" type="checkbox"/>

Details

Locations (Nuc) Enhancement Support Advanced Filtering in the LCO Tracking App

The screenshot displays the 'Locations (Nuc)' application interface within a Mozilla Firefox browser. The main content area is divided into several sections:

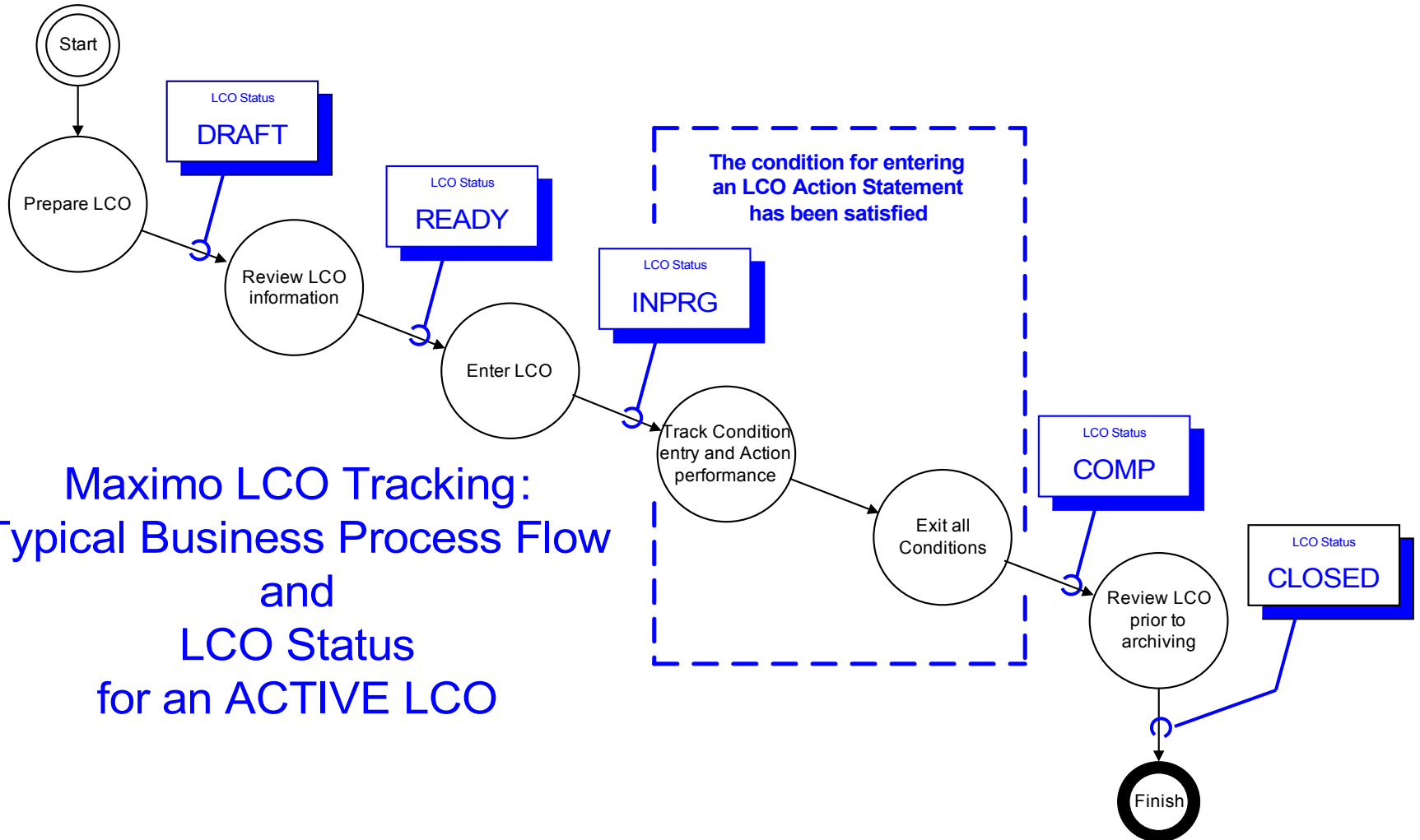
- Location Information:** Location: BR430, Condensate Return Pump- Centrifugal/100GPM60FTHC, Site: BEDFORD.
- Equipment Reliability:**
 - Criticality: CRIT (Critical Component)
 - PRA Code?
 - GRA Code?
 - Maintenance Rule?
 - Tech Spec?
 - Safety Division: DIV2
 - Instrument Channel: RPS B
- Materials and Services:** Safety Class:
- Associated Equipment Groups:** Filtered to 1 - 1 of 1.

Equipment Group	Description	Type	Boundary Equipment Group?	Equipment Group Modes	Status	Default Group?
BLUE	FEG Blue	FUNCTION#	<input type="checkbox"/>	1,2,3	ACTIVE	<input checked="" type="checkbox"/>
- Associated Tech Specs:** Filtered to 1 - 2 of 2.

Tech Spec	Description	Type	Unit	Applicability
TS 3.5.3	RCIC System	TS	UNIT 2	MODE 1. MODES 2 and 3 with reactor steam dome pres
TESTD1	Test Tech Spec D1	TS	UNIT 2	Modes 1, 2, 3
- Details:**
 - Tech Spec: TS 3.5.3 (RCIC System)
 - Type: TS (Plant Technical Specifications)
 - Unit: UNIT 2
 - Applicability: MODE 1. MODES 2 and 3 with reactor steam dome pres
- Actions for Tech Spec TS 3.5.3:** Filtered to 1 - 4 of 4.

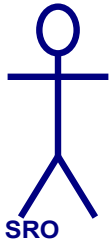
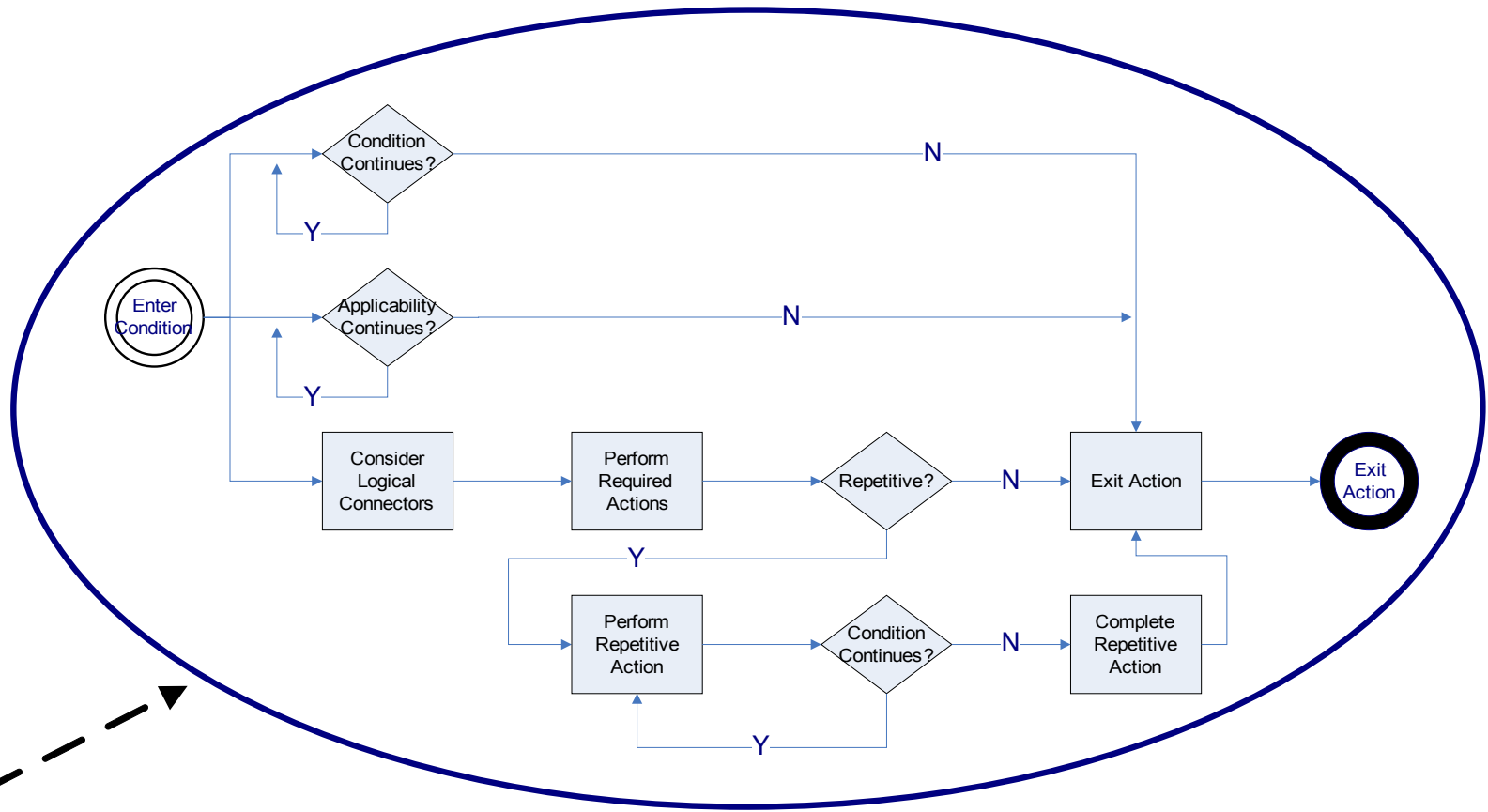
Condition	Condition Description	Action	Action Description	Completion Time	Applies to Location?

Business Process relationship to LCO Status



Maximo LCO Tracking:
Typical Business Process Flow
and
LCO Status
for an ACTIVE LCO

Business Process Flow for a Single Condition



SRO

LCO Tracking – Main Tab

LCO Tracking (Nuc) - Mozilla Firefox

File Edit View History Bookmarks Tools Help

localhost/maximo/ui/?event=loadapp&value=pluslco&uisessionid=1&csrftoken=cmivsr870m8pkts63aufnhu1hn

LCO Tracking (Nuc) Bulletins: (0) Go To Reports Start_Center Profile Sign Out Help IBM

Find: Select Action + -

List **LCO** References Retest Specifications Log All LCO Actions Due

The LCO record is used to monitor compliance with the requirements of an LCO or equivalent regulation and to manage the actions that are required when equipment conditions deviate. The regulatory requirements to which the LCO record applies are specified in the associated tech spec record.

LCO: System Outage Pump BR-430 Site: Status:

Tech Spec: Test Tech Spec 01 Tech Spec Type: LCO Type:

Applicability: Tech Spec Unit: LCO Category:

Tech Spec Note: Tech Spec Modes: LCO Mode:

Tech Spec Actions Note: Mode Entry Requirement: Classification:

LCO Comments: Attachments: Class Description:

Component

Location: Condensate Return Pump- Centrifugal/100GPM@0FTHD

Asset:

Configuration Item:

Safety Division:

Instrument Channel:

Scheduling Information

Scheduled Start:

Scheduled Finish:

Actual Start:

Actual Finish:

Next Action Due for Current LCO:

Responsibility

Created By:

Creation Date:

Owner:

Owner Group:

Actions: 1 - 3 of 3 Download

To provide information about the actions that are currently in progress, select Manage Actions from the Select Action menu.

Condition	Condition Description	Action	Action Description	Completion Time Value	Repetitive??	Condition Start	Enter Action ?	Next Completion Required By	Action Complete	Confirm Performance?	Exit Action?
A	Condition A	A.1	Action A.1	0	<input checked="" type="checkbox"/>	4/28/12 10:03 PM	<input checked="" type="checkbox"/>	4/28/12 10:25 PM	4/28/12 10:03 PM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A	Condition A	A.2	Action A.2	1	<input type="checkbox"/>	4/28/12 10:03 PM	<input checked="" type="checkbox"/>	4/28/12 11:03 PM	4/28/12 10:03 PM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B	Condition B	B	Action B	60	<input type="checkbox"/>	4/28/12 10:03 PM	<input checked="" type="checkbox"/>	5/1/12 10:03 AM		<input type="checkbox"/>	<input type="checkbox"/>

Repetitive Performance of Action A.1 1 - 2 of 2 Download

Current Performance Complete	Confirm Current Performance?	Next Completion Required By	Completion Comment
4/28/12 10:15 PM	<input checked="" type="checkbox"/>		
4/28/12 10:10 PM	<input checked="" type="checkbox"/>	4/28/12 10:25 PM	

Alert Ops to All LCO Actions Due

* Also Visible in the Duty Stations Application

LCO Tracking (Nuc) - Mozilla Firefox

File Edit View History Bookmarks Tools Help

LCO Tracking (Nuc)

localhost/maximo/ui?event=loadapp&value=pluslco&uisessionid=2&csrfToken=hdF579gnhik50jpk3vo13urkh

LCO Tracking (Nuc) Bulletin: (0) Go To Reports Start Center Profile Sign Out Help

Find: Select Action

List LCO References Retest Specifications Log All LCO Actions Due

The information in this table is derived from active LCO records for the current site. An action is due if it is entered but not yet exited.

Date and Time of Last Refresh: 4/30/12 2:55 PM Refresh

Actions Due Filter 1 - 4 of 4 Download

LCO	Description	Tech Spec	Description	Tech Spec Unit	Safety Division	Action	Action Description	Next Completion Required By
1001	System Outage Pump BR-430	TEST01	Test Tech Spec 01	UNIT 2	DIV 2	B	Action B	5/1/12 10:03 AM
1004	H2 Recombiner inop	TS3.6.3.1	Primary Containment and Drywell Hydrogen Igniters	UNIT 2	DIV2	A.1	Restore primary containment and drywell hydrogen ignitor division to OPERABLE status.	5/30/12 2:40 PM
1004	H2 Recombiner inop	TS3.6.3.1	Primary Containment and Drywell Hydrogen Igniters	UNIT 2	DIV2	B.1	Verify by administrative means that the hydrogen control function is maintained.	5/1/12 2:40 PM
1004	H2 Recombiner inop	TS3.6.3.1	Primary Containment and Drywell Hydrogen Igniters	UNIT 2	DIV2	B.2	Restore one primary containment and drywell hydrogen ignitor division to OPERABLE status.	5/7/12 2:40 PM

LCO: 1001 System Outage Pump BR-430 Tech Spec Unit: UNIT 2

Tech Spec: TEST01 Test Tech Spec 01 Safety Division: DIV2

Condition: B Condition B Tech Spec Type: TS

Action: B Action B Next Completion Required By: 5/1/12 10:03 AM

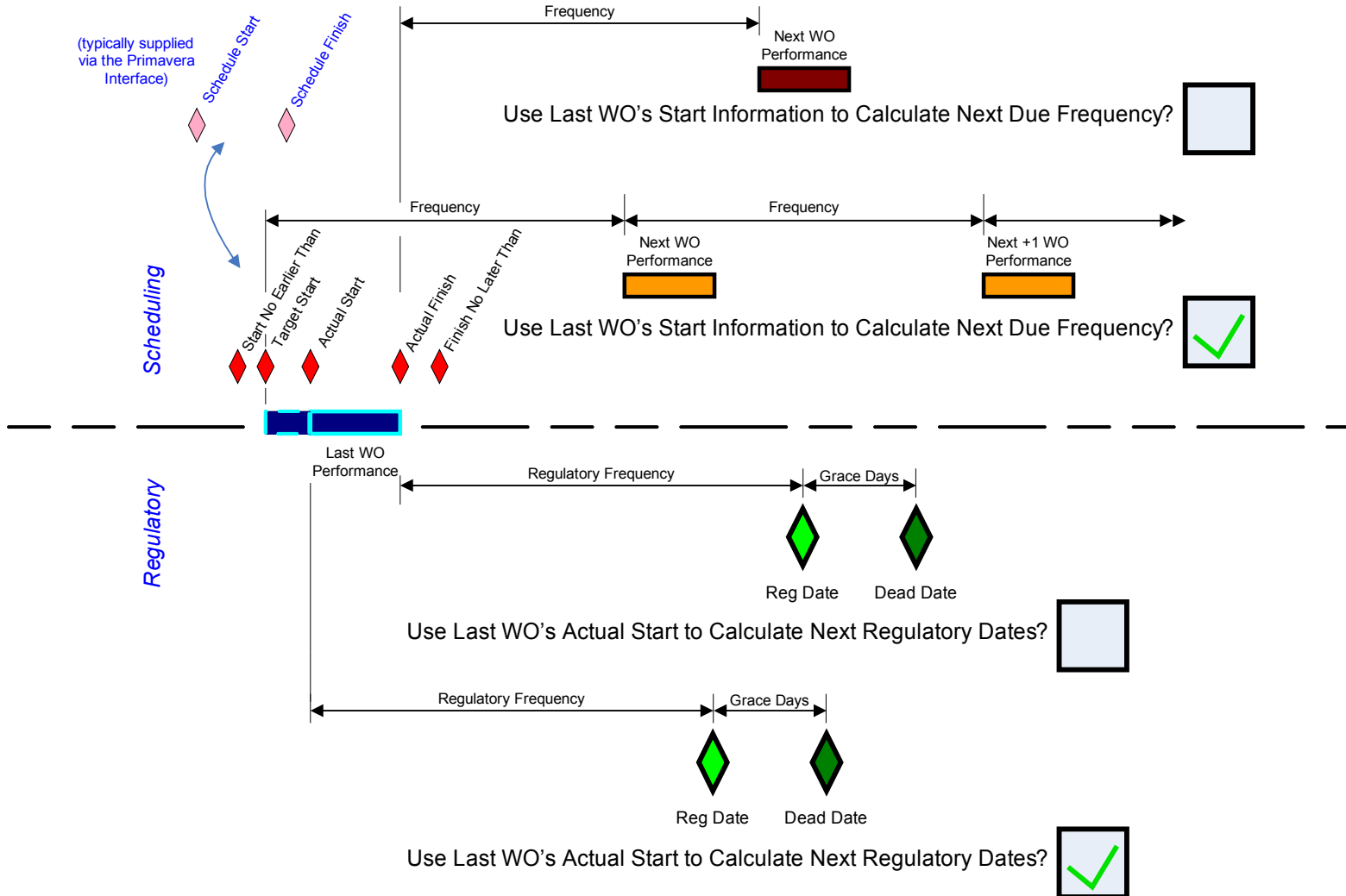
Commitment Tracking (Nuc)

- Identifies and tracks commitments made to external or internal bodies
- Capture comments and the review / approval of the Commitment
- Relate Work Orders and PMs to the Commitment
- Tracks status and progress of work related to the Commitment
- Cross-reference between the Commitment and the Work Order
- **N 7.5 incorporates enhancements to correct inconsistencies in the original design**
 1. Eliminate “back door” access that allowed Commitments to be viewed in the Work Order
 2. Control ability to edit rows in the Generate Work table window following the Generate Work action
 3. Change input field cross validation in the Generate Work table window
 4. Change Save validation requirements for the Generate Work table window
 5. Change selection method for Assets/Locations for Associate PM Generation
 6. Enhance data display in the Generate Work table window

* Surveillance Testing / Regulatory Testing



Scheduling and Regulatory Concepts and Terms



Review of PM Capabilities

- Time and Meter-based generation modes, including autogeneration based on plant sensor input to Maximo Meters
- Master PMs allow rapid creation of consistent PMs for related equipment sets
- PM Hierarchy provides independent scheduling, costing and PMWO ownership capabilities, and permits roll-up grouping of loop, train, or FEG PMWOs
- PM Forecasting, with fold back into future PMWO generation
- Fixed and Floating scheduling algorithms
- Lead time and Slack time on PM record
- Job Plan Sequence
- As-found codes: facilitate feedback of results and provides a basis for PM optimization
- Active Seasonal and Day of Week scheduling
- When warranted, Extended Date allow override of the next PM generation date
- PM Alerts when Corrective Maintenance identified within specified time limits
- PM Forecast capabilities; ties to Scheduler

Additional Surveillance Capabilities added to core PMs

- Regulatory dates establish limits for Tech Spec mandated periodic testing
 - PM Work Orders displays regulatory information
- Ties to reference Maximo Tech Specs and other plant programmatic data
- Maintain full Work Order history and information
 - Easy link access to the previous and current Work Orders for the PM from the main tab
- Participates in Functional Equipment Groups, and ties to Nuclear Scheduling Codes
- PMs may be associated with Impact Plans and Template Clearances
 - IPs facilitates capturing and reusing nuclear work management information with the PM
 - PMs can be grouped so WOs are generated and associated with their CL during WOGEN
- The Frequency application assists scheduling consistency
- PM Sequence functionality creates a cycle for performance of multiple PMs
- PM performance may be tied to both Corrective Actions and to Commitment Tracking
- Reference Type domain linked to References table window

Advanced Scheduling Capabilities

- Day of week input available for calculation for Target Start Date / PM Start Date for PM WO scheduling
 - Day of week adds Schedule Early on Conflict capability to the existing Day of Week functionality for required Tech Spec conservatism
- Supports the 13-week schedule
 - Frequency Sequence functionality supports the use of multiple frequency values for syncing occurrences of a monthly surveillance within either a 12 or a 13 week cycle; the primary use case is scheduling three occurrences of a monthly surveillance within 12 or 13 week cycles
- Provide the Ability to Reschedule the PM and PM Work Orders Due Dates Based On Manual Date Entry
 - Use Case: adjust for refueling outages or extended mode changes by rescheduling a block of WOs
 - Uses checks and balances to avoid user errors; includes date validation prior to rescheduling
 - User access to the select action limited via Maximo Security, and full accountability is established
 - Based on functionality developed by Dev Partners
- Upgrade PM Sequence functionality
 - Calculation of the PM Sequence Date, WO Target Start Date, WO Target Finish Date and Regulatory Dates now map to the standard Maximo Floating algorithm
- Flexible Clearance generation option, including PMWO Grouping onto Template Clearances

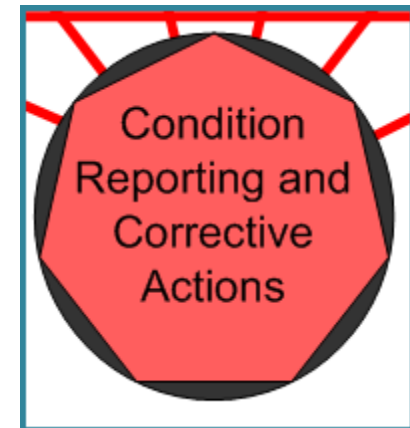
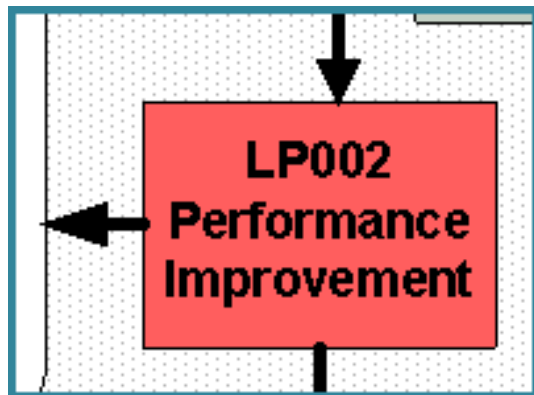
Advanced Regulatory Capability

- Calculate and Display Date/Time in lieu of Date alone, for Regulatory-Related Dates in PM (Nuc)
 - Displays all applicable margin; applies to Regulatory Date, Grace Days, Dead Date, (optional 3.25 Dead Date)
- Permit Selection of Calculation Method from either Actual Start or Actual Finish of the preceding PMWO for Regulatory Dates
 - Calculating the Dead Date on the actual finish is not conservative in all cases
 - Capability is applied at a Surveillance (PM-specific) basis
 - Not available for PM Sequence PMs
- Strengthen Schema
 - Associate Regulatory information stored with the PM, in addition to the PMWO
- Provide manual adjustment of PM (Nuc) Dead Dates
 - User access to the select action limited via Maximo Security, and full accountability is established
- Regulatory Calculate and display Estimated Dates
 - The Estimated Dates are determined based on the Regulatory Frequency and Grace for the PM, and keyed to best-available predecessor WO information: Actual Dates are the best; then Scheduled Dates; then Target Dates
- Corrective Action Control may be invoked on PMs
 - Controlled in Maximo Condition Reports – precludes deleting PMs under CAC
- Ties to the Tech Spec and Surveillances framework
 - Objects are fully revision controlled

Regulatory: Provide Management and Retest for Multiple Asset / Location / CI PMWOs

- Add flexible management of Surveillances that test multiple components
 - Identify testing performance and work history for all components
 - Partial Performance functionality is tied to the actual tested components
 - Track last performance, complete/partial status and next performance
 - Automatically generate Retest WOs when required; manual Retest WOs also available
- Available
 - For PMWOs
 - Of Work Type <xxxxx> as set in Nuclear Options > Work Type
 - Not Available for PM Sequence WOs
- Leverages core Maximo 7 multi-capability; key elements:
 - Work Order Completion Codes, and the Is Partial? flag
 - Asset / Location Completion Codes

- * Condition Reports
 - * Solutions
- * Corrective Action Templates



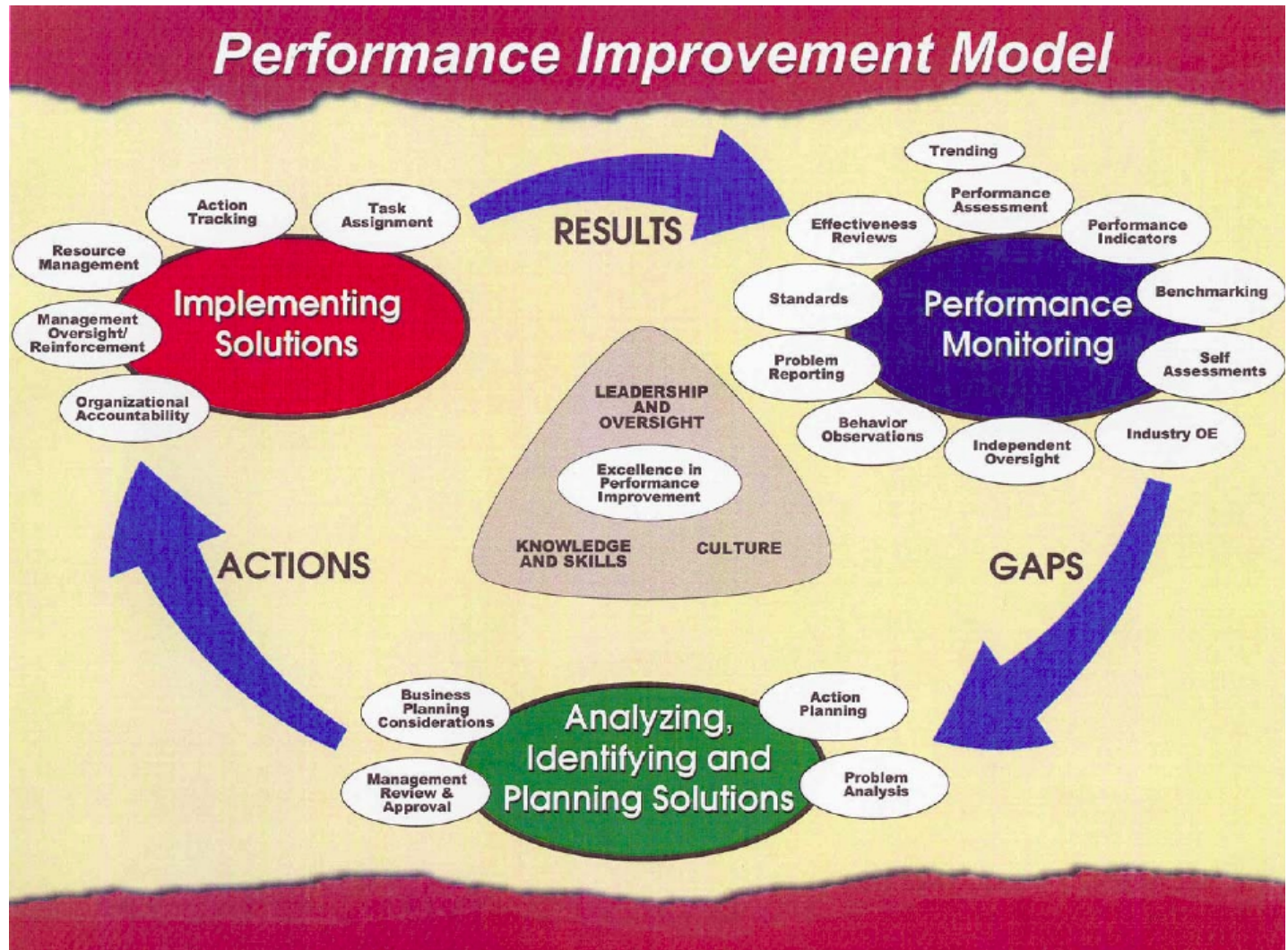
Functionality is keyed to the Industry's Performance Improvement Model

INPO 05-005,
Guidelines for
Performance
Improvement at
Nuclear Power
Stations

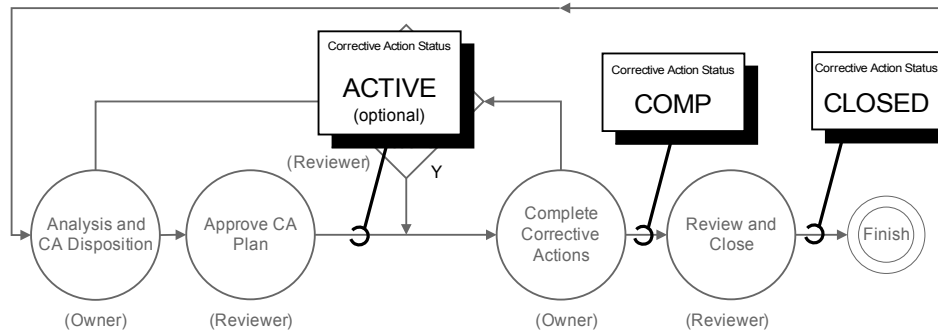
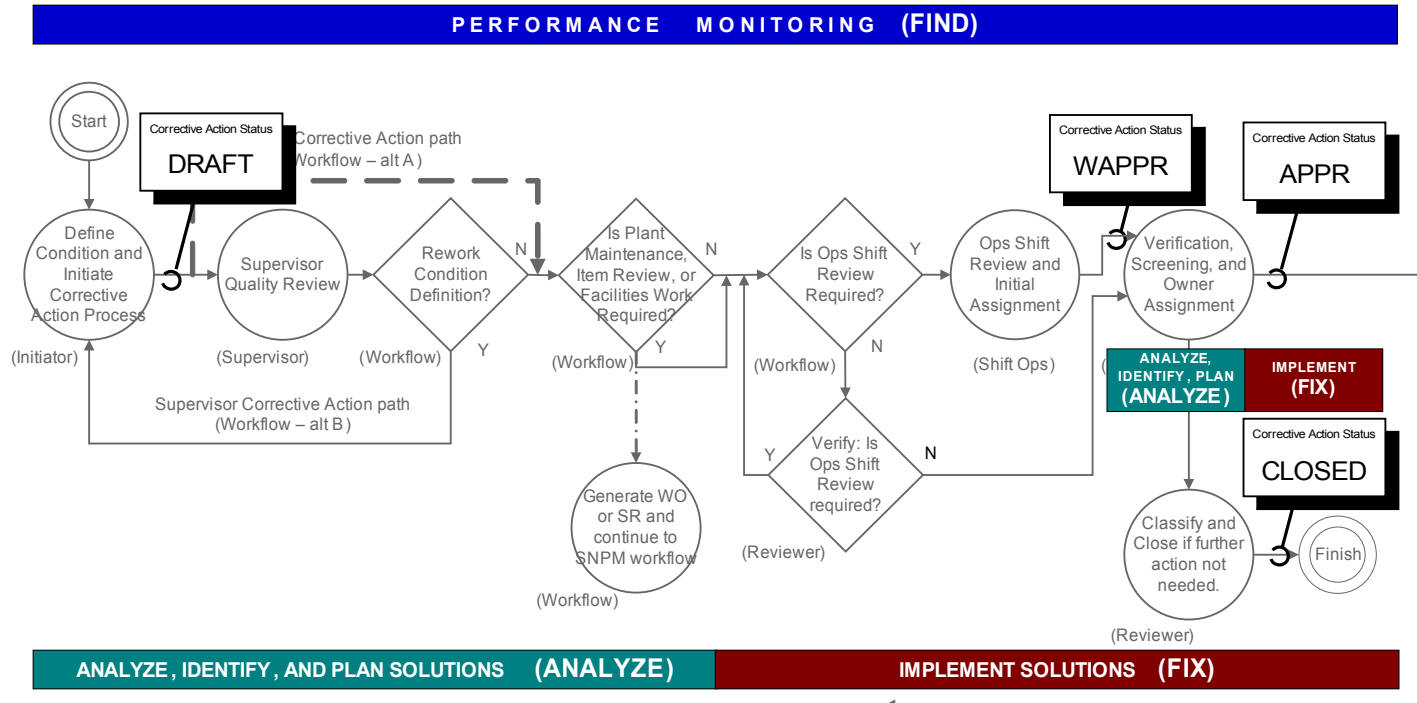
Complementary to
and updates:

* AP-903,
Performance
Improvement
Process Description

* Corrective Action
links in AP-913,
Equipment
Reliability Process
Description



Process Flow (Industry PI Model Phases Superimposed)



Condition Tab

The screenshot displays the Maximo 7.1 Sales VM interface within a Microsoft Internet Explorer browser window. The browser address bar shows the URL: `http://localhost/maximo/ui/?event=loadapp&value=plusca&uisessionid=1223037972796`. The page title is "Corrective Action (Nuc)".

The main content area is titled "Corrective Action (Nuc)" and features a "Condition" tab. The data is organized into several sections:

- Condition Details:**
 - Corrective Action: 1150
 - Failed SP-E5101, RQIC Full Flow
 - Status: DRAFT
 - Level: [Empty]
 - Category: ENHANCE
 - Analysis: [Empty]
 - Reported Priority: 1
 - Internal Priority: 1
 - Service Group: [Empty]
 - Service: [Empty]
 - Vendor: [Empty]
 - Site: BEDFORD
 - SLA Applied?:
 - Create WO Options: MULTI
 - Attachments: [Empty]
- Initial Corrective Action:** Secured pump from test and initiated required surveillance run of HPCS. Entered LCO. Generated troubleshooting WVO for I&C.
- Suggested Solution:** Flow was erratic throughout test - suspect controller.
- Detection Method:** SURVEILLANCE
- Additional Action Req'd?**
- Action Type:** PLNT
- Is Known Error?**

Below the condition details are sections for:

- Asset Information:**
 - Asset: [Empty]
 - Location: 1E51-COO1
 - Configuration Item: [Empty]
 - Target Description: [Empty]
 - GL Account: [Empty]
 - Asset Site: BEDFORD
 - Unit: UNIT 1
 - Plant System: [Empty]
 - Safety Class: [Empty]
 - Tech Spec?:
 - Maintenance Rule?:
 - Criticality: [Empty]
- User Information:**
 - Reported By: WILSON
 - Name: Mike Wilson
 - Phone: (617) 555-9017
 - E-mail: m.wilson@helwig.com
 - Supervisor Review: [Empty]
 - Name: [Empty]
 - Phone: [Empty]
 - E-Mail: [Empty]
- Dates:**
 - Reported Date: 10/3/08 9:00 AM
 - Discovery Date: 10/3/08 9:00 AM
 - Target Contact: [Empty]
 - Target Start: [Empty]
 - Actual Contact Date: [Empty]
 - Actual Start: [Empty]
 - Global Issue?:
 - Related to Global ID: [Empty]

The bottom of the screen shows the Windows taskbar with the Start button, system tray icons, and the time 9:28 AM. The VMware Player interface is visible at the bottom right.

Apply Level Functionality Leverages SLA Functionality to Reinforce CR Timeliness

Select Action

- Change Status
- View History
- Add Supervisor Review
- Add/Modify Operations Shift Review
- View Costs
- Edit History Corrective Action
- Create
- Apply Corrective Action Template
- Select Owner
- Take Ownership
- Modify/Delete Work Log
- Show Similar Tickets
- Apply Level/SLA**
- View SLAs**
- Add/Remove Corrective Action Control
- Attachment Library/Folders
- Duplicate Corrective Action
- Delete Corrective Action
- Add to Bookmarks
- Run Reports

Corrective Action (Nuc) - Microsoft Internet Explorer

Address: http://localhost/maximo/ui/?event=loadapp&value=plusca&sessionid=1223037972796

Corrective Action (Nuc)

Corrective Action: 1150 Failed SP-E5101, RCIC Full Flow

Condition Details: Failed quarterly ISI surveillance full flow test SP-E5101. Pump failed to develop required flow at specified dp conditions.

Initial Corrective Action: Secured pump from test and initial Entered LCO. Generated trouble

Suggested Solution: Flow was erratic throughout test

Detection Method: SURVEILLANCE

Additional Action Req'd?:

Action Type: PLINT

Is Known Error?:

Asset Information

Asset: [Empty]

Location: [Empty]

Configuration: Reactor Core Isolation Cooling Pump

User Information

Reported By: WILSON

Name: Mike Wilson

Phone: (617) 555-9017

E-mail: m.wilson@helwig.com

Supervisor Review

Name: [Empty]

Phone: [Empty]

E-Mail: [Empty]

Dates

Reported Date: 10/3/08 9:00 AM

Discovery Date: 10/3/08 9:00 AM

Target Contact: [Empty]

Target Start: [Empty]

Actual Contact Date: [Empty]

Actual Start: [Empty]

Global Issues

Global Issue?:

Related to Global ID: [Empty]

Apply Level/SLA

Level: [Empty]

Select Value

Value	Description
EXTEND 10	Extension , add 10 days
LEVEL A	Level A, 72-hour completion
LEVEL B	Level B, 10-day completion
LEVEL C	Level C, 30-day completion

Cancel

Screening Tab

Core Assign Owner functionality

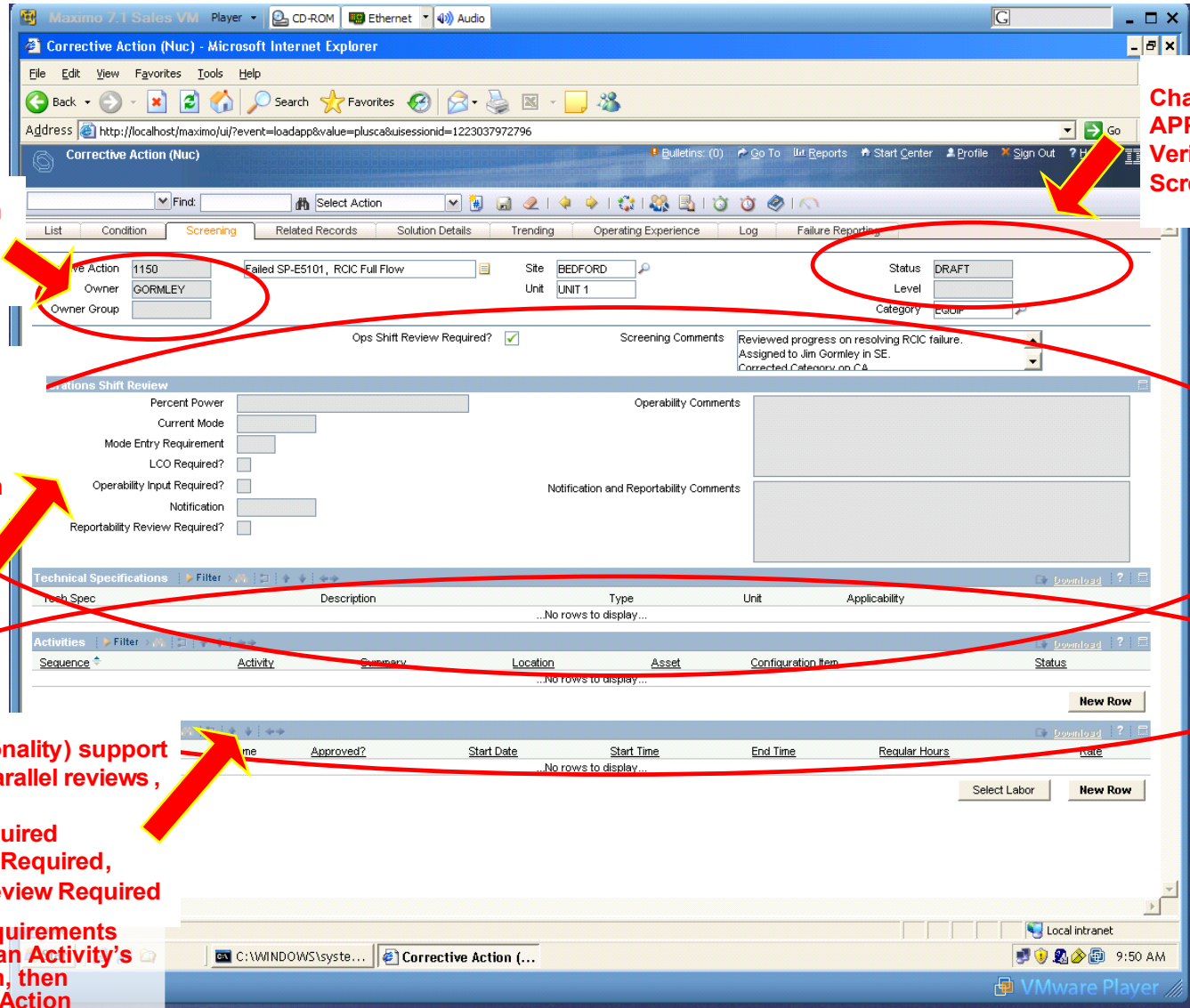
Change status to APPR after Verification and Screening Review

Ops Shift Review data and the Technical Specifications table window is managed from the Select Action

Activities (core functionality) support rapid assignment of parallel reviews, for example

- * Operability Input Required
- * Reportability Review Required,
- * Maintenance Rule Review Required

These and other review requirements may be pre-established in an Activity's Job Plan and Classification, then associated to a Corrective Action template and applied to the Corrective Action as needed



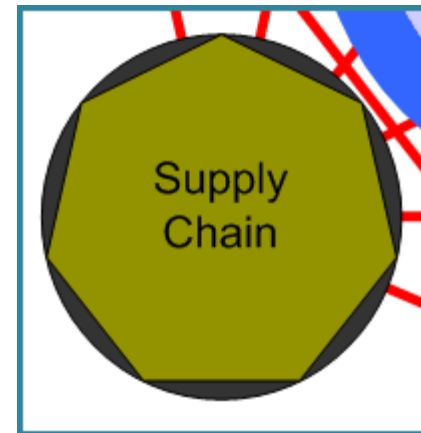
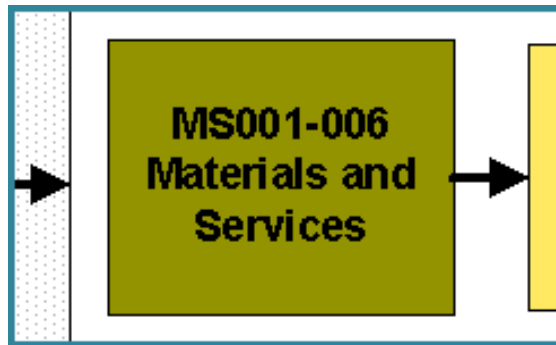
Trending Tab: Example Shows Typical Industry Trend Codes

The screenshot shows the 'Corrective Actions (Nuc)' application in Mozilla Firefox. The 'Trending' tab is active, displaying details for corrective action 1155: 'Pump seal is leaking 10 drops/minute'. A 'Classify' dialog box is open, showing a tree view of trend codes:

- CP1:Chemical contamination
- CP2:Fire
- CP3:Particulate contamination
- GADS CODES:GADS Classificatin Codes
 - COREFUEL:Core/Fuel
 - 2010:High activity in Reactor Coolant System (RCS)
 - 2020:High activity in off-gas system
 - 2030:Fuel failure
 - CRD:Control Rods and Drives
 - 2110:Control rod drive motors
 - 2111:Control rod magnetic jack drives
 - 2112:Control rod hydraulic drives
- INPO CAUSE CODES:INPO Cause Codes

The background interface includes fields for 'Corrective Action', 'Owner', 'Site', 'Unit', 'Status', 'Level', and 'Category'. The 'Trending Comments' field contains: 'Trending according to SDNRC procedure HYN-2-CAC-TR'. The 'Trend Classifications' section shows a list of codes with expandable arrows.

- * Qualified Vendors and Materials
 - * Terms and Conditions
 - * PR, PO, RFQ



Qualified Vendors (shown) are Mapped to Qualified Items, and Establish Controls in the Purchasing Process

The screenshot displays the 'Companies (Nuc)' application interface. The main form shows details for 'AJAX PIPE' with the following information:

- Company: AJAX PIPE
- Organization: EAGLENA
- Quality Status: QUALIFIED
- NUPIC Vendor Code: 12345

An 'Add/Modify Company Audit Data' modal window is open, showing a table of audit records:

Last Audit Date	Next Audit Date	Audit Organization	Audit Result	Audit Comments
10/12/11	10/12/12	USA Alliance	PASSED/SAT	Audit per NUPIC guidelines

The main interface also includes sections for 'Company Audit Information' (Next Audit Date: 10/12/12, Last Audit Date: 10/12/11, Audit Result: PASSED/SAT), 'Quality Terms' (QA, NQA 100 Compliance), and 'Scope of Approval Data' (APPROVED FOR ASTM A-40 PIPING AND FITTINGS).

RFQs, PRs, and POs Perform Multiple Checks, Including Vendor to Item Quality Match, and Block Mixed Quality Items on the PO (shown)

The screenshot displays the IBM Purchase Orders (Nuc) application interface. At the top, the title bar reads "Purchase Orders (Nuc)" and includes navigation options like "Go To", "Reports", "Start Center", "Profile", "Sign Out", and "Help". Below the title bar, there's a search bar with "Find:" and a "Select Action" dropdown. A toolbar contains various icons for navigation and actions.

The main content area shows details for a Purchase Order (PO) with ID "1094" and description "Pipe fittings". The site is "BEDFORD" and the status is "WAPPR". The total cost is "200.00".

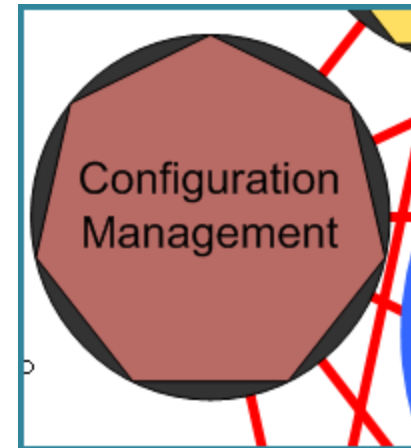
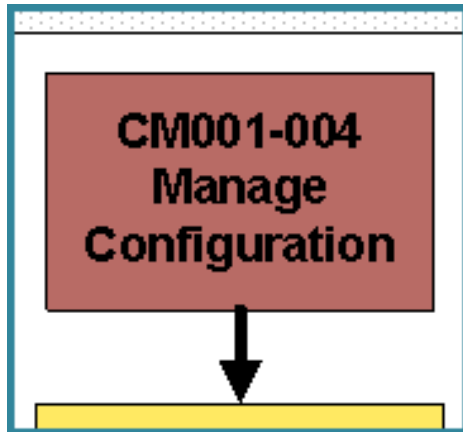
Below the details, there's a table for "PD Lines" with columns: Line, Item, Description, Quantity, Order Unit, Unit Cost, Line Cost, Tax, Distributed?, and Vendor?. The table shows two lines:

Line	Item	Description	Quantity	Order Unit	Unit Cost	Line Cost	Tax	Distributed?	Vendor?
1	52-134	Connector, Pipe-4 In Male	1.00	BOX	200.00	200.00	0.00	<input type="checkbox"/>	<input type="checkbox"/>
2			1.00		0.00	0.00	0.00	<input type="checkbox"/>	<input type="checkbox"/>

The "Line Item" section below the table shows details for Line 2. A red circle highlights a validation error message box that appears when the "Item" field is empty. The message reads: "Remarks: Mixed quality items not allowed. (BMXAK0046)". Below the message, there are buttons for "Edit My Value" and "Go Back".

On the right side of the "Line Item" section, there are several checkboxes for additional requirements: "Receipt Required?" (checked), "Inspection Required?" (unchecked), "Issue on Receipt?" (unchecked), "Charge to Store?" (unchecked), "Distributed?" (unchecked), "Prorate Service?" (unchecked), "Tax Exempt?" (unchecked), and "Consignment?" (unchecked).

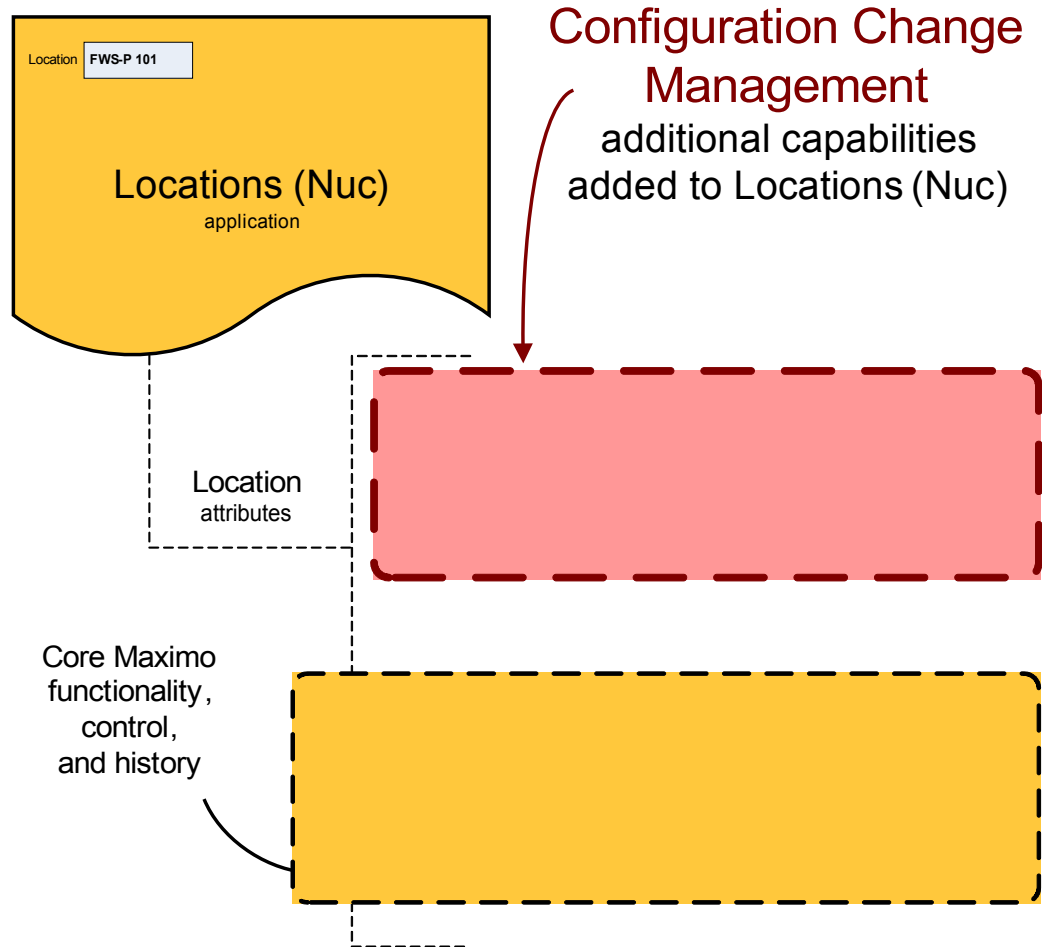
- * Configuration Change Management
- * Quick Locations / Quick Assets



Configuration Change Management in the Nuclear Solution

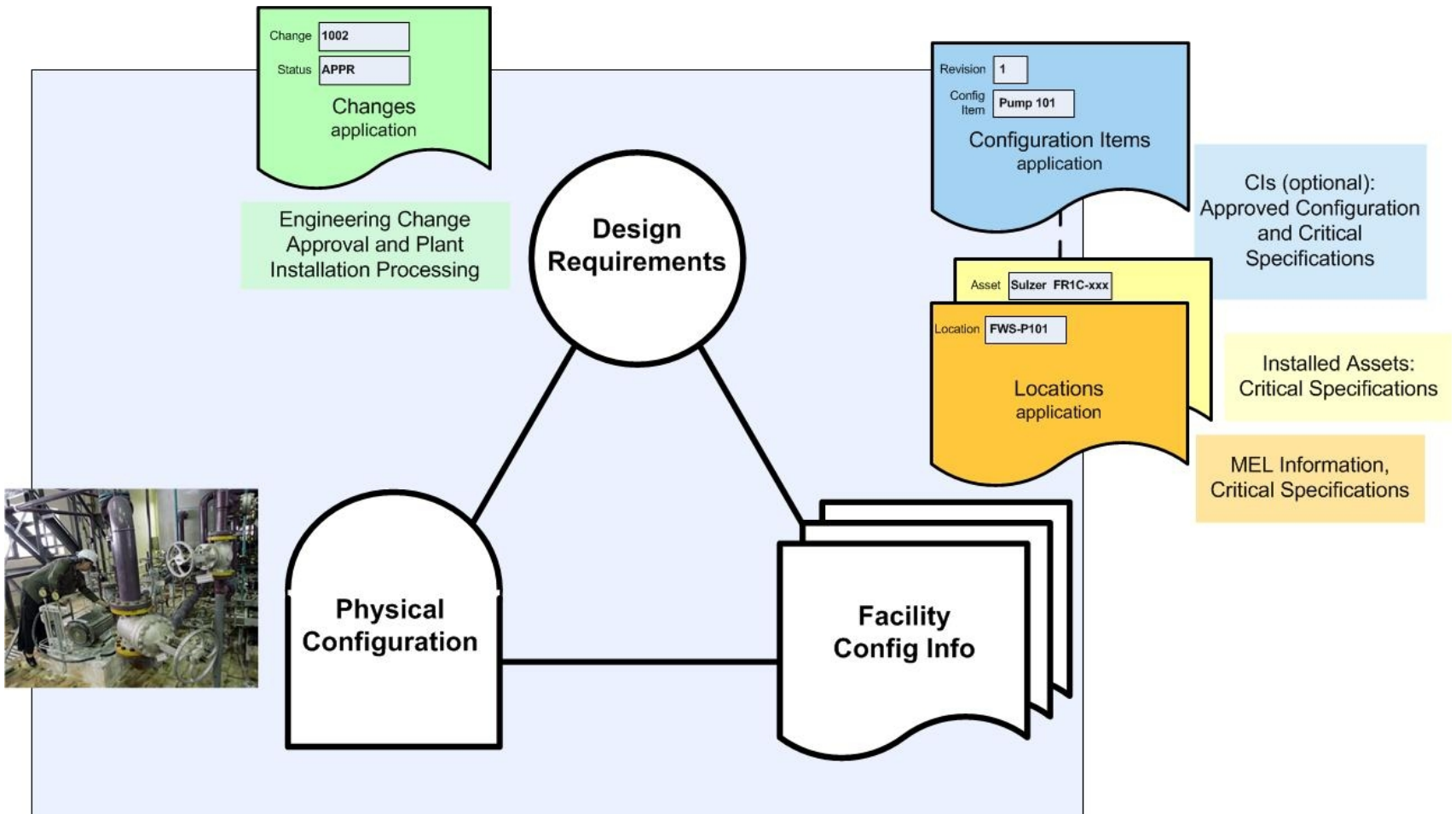
Maximo Nuclear Release		
Enhancement	Description	Why is it Important?
Configuration Change Management	<p>Add the ability to create new and manage changes to Location, Asset, or Configuration Item (CI) information. Following engineering approval of the change and implementation in the plant the change becomes the approved Location / Asset / CI information. Leverages Change and Release functionality to encapsulate engineering approvals and in-plant implementations prior to promoting the new versions of configuration data. Addresses one or several Locations, Assets, CIs for effective data input.</p>	<p>Nuclear operators require the ability to control changes to the design and engineering specifications for all components. Managing and maintaining the required changes in Maximo eliminates costly interfaces.</p>

CCM extends core Location functionality



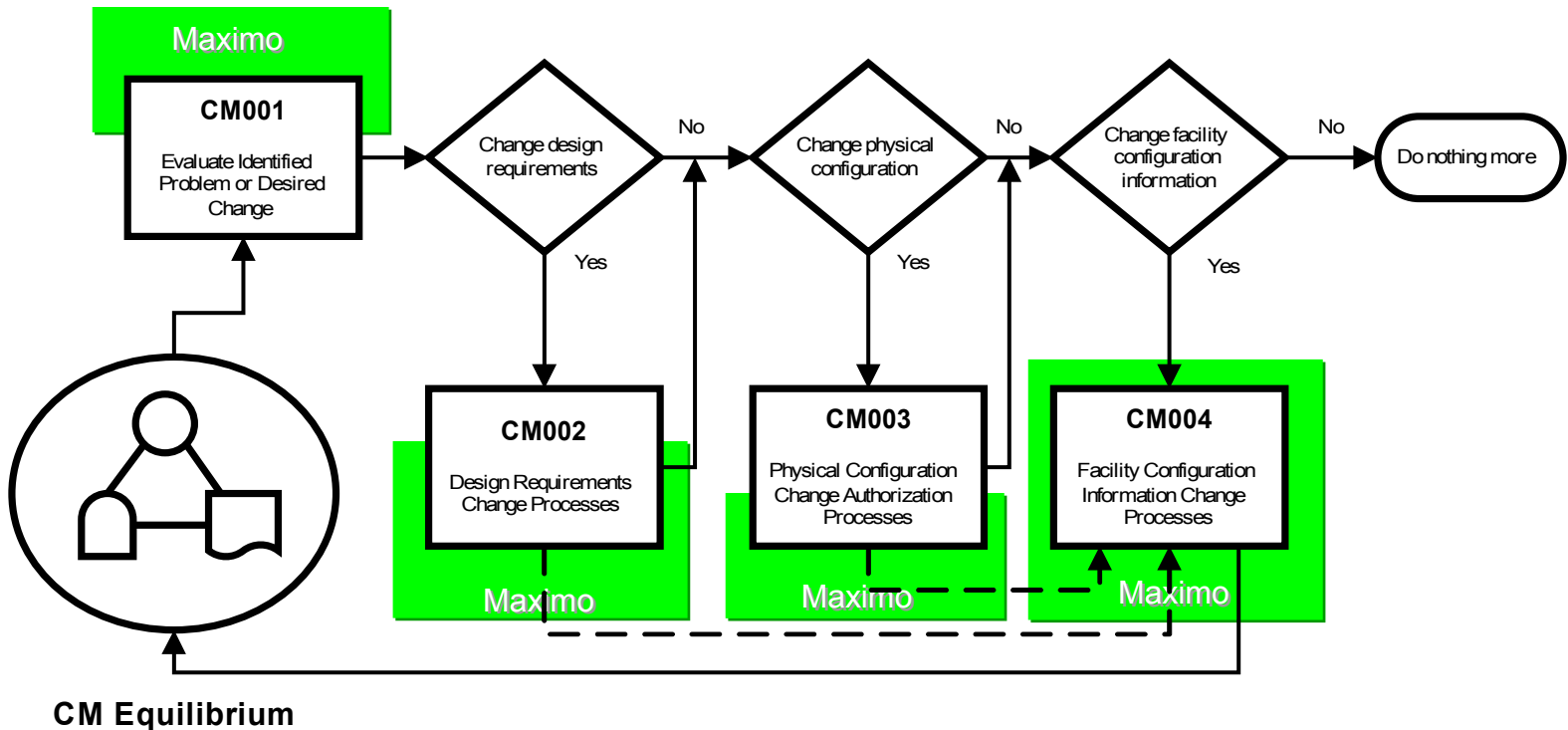
Maximo Nuclear Maps to Industry CM Standard

. . . AP-929

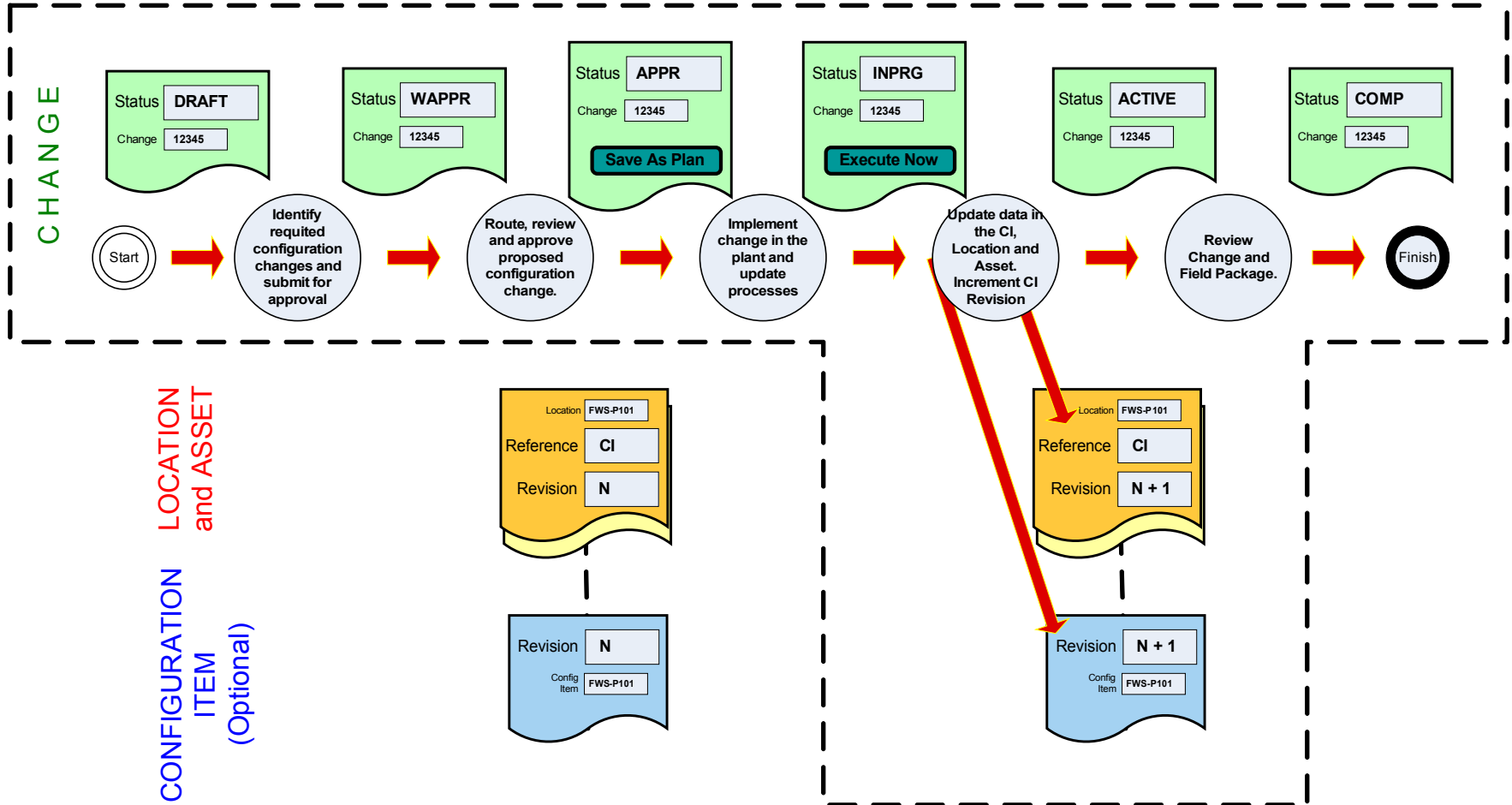


Configuration Management, AP-929, and Maximo Nuclear

- CM001: The Maximo Condition Report triggers and tracks the assessment of change demand. If justified, the Maximo Change record is initiated to manage the CM change.
- CM002: When design requirements specified on the Maximo Location, Asset, or CI (Configuration Item) require change, the individual requirements are identified on the Change and reviewed against station requirements.
- CM003: The Change record has the full capabilities of a WO, and may be used to manage completion of the physical change. Alternatively, Related WOs and Related Tickets may also be used.
- CM004: Once all aspects of the configuration change are completed and the change is ready for incorporation into the CM baseline, the modification to the Location, Asset, and CI records are implemented in the Change.



Process Flow and Object Relationships



Changes (Nuc) Screenshot

- * The Change (Nuc) app manages modifications to multiple fields and Specification Attributes on one or more Locations, Assets, and CIs
- * Release (Nuc) is similar; both are WOs

Change C1014 Summary: Add Aux. Condensate Pump to system xxxx. Status: WAPPR

Locations

Location	Description	Base Rev.	Causes Rev.	Current Rev.	Completed
BR1000	Steam Driven Aux Condensate Pump	0	<input checked="" type="checkbox"/>	0	<input type="checkbox"/>

Location Fields

Field Name	Date Type	Value
DESCRIPTION	ALN	Steam Driven Aux Condensate Pump
PLUSCRITICAL	ALN	RTF
PLUSMRULE	YORN	N

Location Specifications

Attribute	Alphanumeric Value	Numeric Value	Unit of Measure
CAPACITY		300.0	
DRIVER	Steam		
NPSH	30		

Planned Modifications

Location	Field	Old Value	New Value
BR1000	DESCRIPTION	Steam Driven Aux Condensate Pump	
BR1000	PLUSCRITICAL	RTF	CRIT
BR1000	PLUSMRULE	N	Y

Planned Modifications

Location	Attribute	Old Value	New Value
BR1000	CAPACITY	300.0000000000	280.0000000000
BR1000	DRIVER	Steam	Steam
BR1000	NPSH	30	30

Locations (Nuc) Screenshot

The Location's current approved configuration and history is available on the Location record (shown), and also on the Change record responsible for the configuration action.

The screenshot displays the 'Locations (Nuc)' application interface. The main record shows the following details:

- Location:** CBCW-P2A Control Building Chilled Water
- Item:** [Empty]
- Status:** OPERATING
- Revision:** 1
- Revision Date:** 11/12/09 10:34 PM
- Classification:** PUMP \ CNTRFGL
- Class Description:** Centrifugal Pump
- Site:** BEDFORD
- Unit:** UNIT 2

The 'Configuration Change Events' table shows the following data:

Revision After Execution	Changed Date	Changed By	Record Type	Record Key	Description
1	11/12/09 10:34 PM	WILSON	CHANGE	C1016	Adjust NPSH and Capacity values
0	11/12/09 10:23 PM	WILSON	CHANGE	C1015	Promote to OPERATING

The 'Fields Changed in Current Event' table shows the following data:

Field	Title	Old Value	New Value
CLASSSTRUCTUREID	Class Structure	1001	1001
ITEMNUM	Item		
STATUS	Status	NOT READY	OPERATING
PLUSREVDATETIME	Revision Date		11/12/09 10:23 PM
PLUSQUAL	Safety Class	N	Q

The 'Specifications Changed in Current Event' table shows the following data:

Attribute	Old Value	New Value
CAPACITY		250.0000000000
DRIVER		15 HP 3 phase 480 V
NPSH		30 inches WG
SIZE		6.0000000000
SPEED		1,780.0000000000

Configuration Change Designer (Nuc) Screenshot

- * The designer app allows programmatic selection of which attributes on the Location, Asset, and CI are controlled, and how they are controlled (graded approach)
- * A graduated approach: the level of control is also specified: Change/Release process required for editing; and causes revision or not

The screenshot displays the Configuration Change Designer (Nuc) application interface. It is divided into several sections:

- Organizations and Sites:** A table listing organizations and sites. The selected entry is EAGLENA (EAGLE Inc. North America) at the BEDFORD site (Bedford MA Site of EAGLE Inc. North America).
- Configuration Fields for EAGLENA and BEDFORD:** A table listing configuration fields. The selected field is PLUSMRULE. The details section shows:

Use With	LOCATIONS
Table	LOCATIONS
Field	PLUSMRULE
Status	ACTIVE

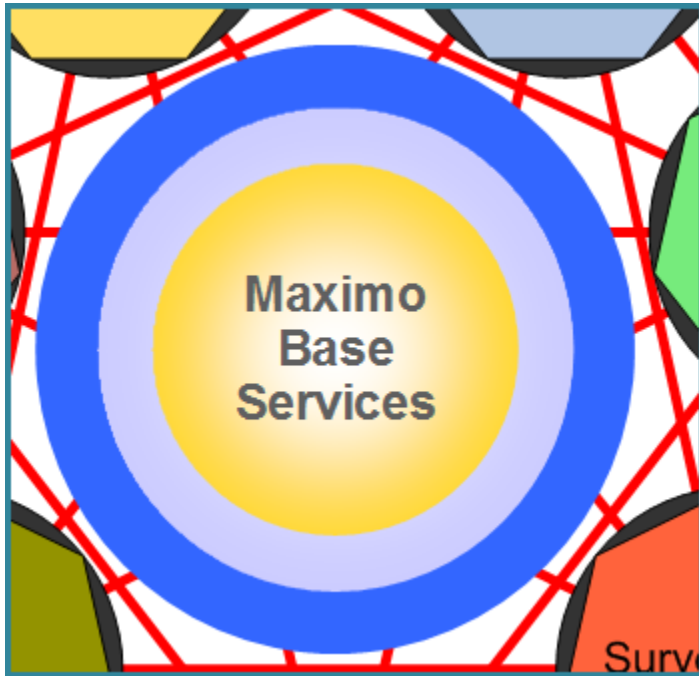
 The details also include a note: "The Maintenance Rule is another method of ide". A control panel on the right indicates:

Requires Process?	<input checked="" type="checkbox"/>
Causes Revision?	<input checked="" type="checkbox"/>
- Configuration Classifications for EAGLENA and BEDFORD:** A table listing classifications. The selected classification is CNTRFGL (Centrifugal Pump).
- Configuration Attributes for CNTRFGL:** A table listing configuration attributes. The selected attribute is TTLHD (Total Head). The details section shows:

Attribute	TTLHD	Total Head	Status	ACTIVE
-----------	-------	------------	--------	--------

 A control panel on the right indicates:

Requires Process?	<input checked="" type="checkbox"/>
Causes Revision?	<input checked="" type="checkbox"/>



Nuclear Content

Content in Maximo is generally developed during implementation, and includes Work Flows, Start Centers, Roles, KPIs, Reports, and Escalations. The Nuclear Content provides examples and templates for the implementation team.

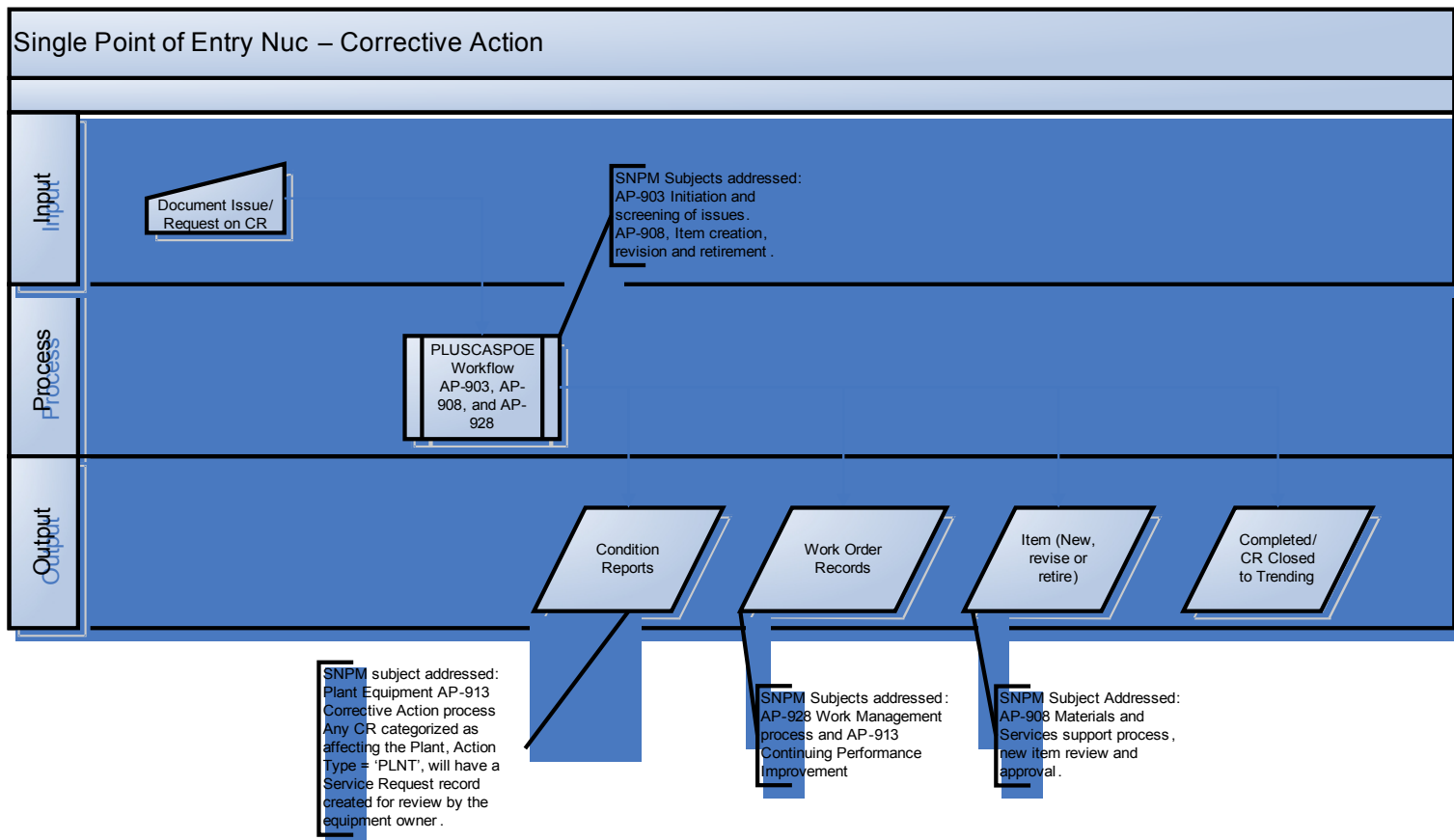
Overview

- Nuclear Content in Maximo describes a group of features that supplement standard module and application functionality; in all cases this content provides a basis for further elaboration to address unique site requirements

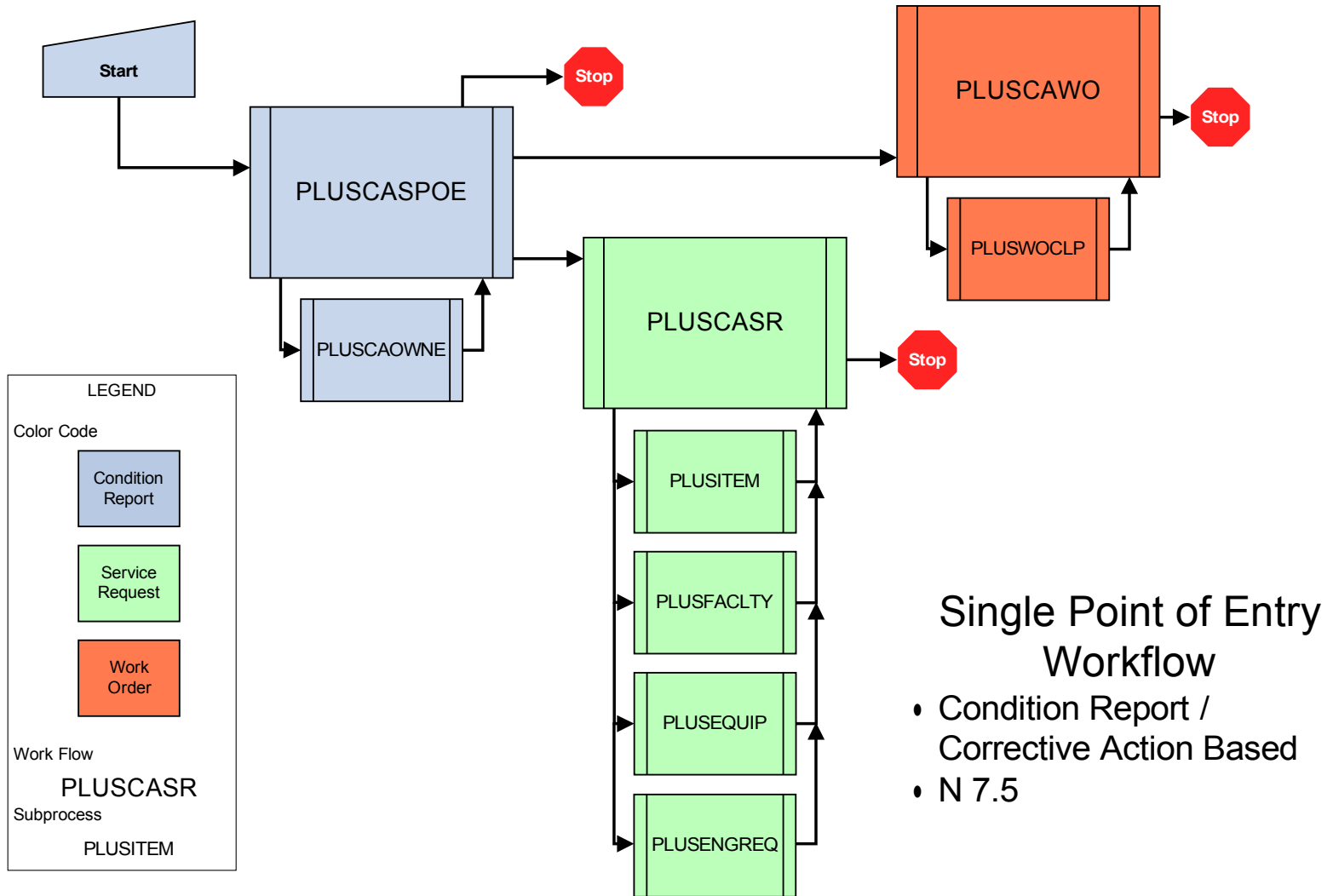
- Includes:
 - A set of Work Flows that provide robust support of the Standard Nuclear Performance Model (SNPM) processes
 - These workflows complement the inherent business logic built into Maximo Nuclear business applications
 - Maximo Start Centers keyed for specific nuclear power roles involved in using Maximo
 - Examples of the dozen roles include the Maintenance, Operations, Work Management, Planning, and Materials Management personnel involved with performing nuclear power station work
 - Key Performance Indicators (KPIs) that cut across Maximo applications, useful for determining work process effectiveness and program performance; examples:
 - Process Output Goals and Measures
 - Task Level Measures
 - Industry-standard Reports necessary for nuclear plant process management

Workflows

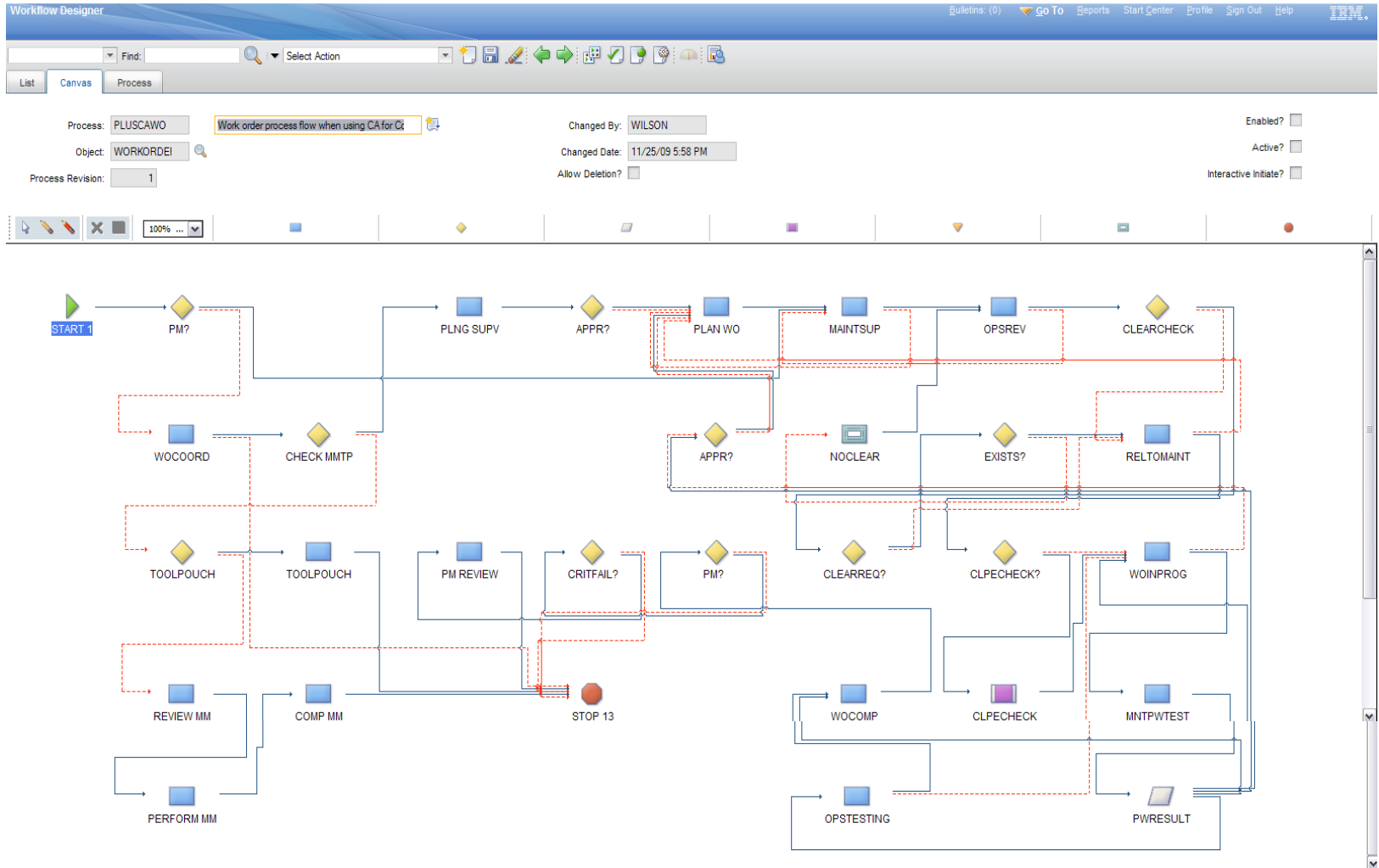
- A collection of individual workflows combine to offer a complete Single Point of Entry model for the identification of all plant work



SPOE Workflows and Interactions: based on CR



Detailed Example: The Work Order Workflow Maps to AP-928



Example Start Center for a Maintenance Supervisor

The screenshot displays the Maximo Start Center interface for a Maintenance Supervisor. The browser window shows the URL `http://localhost/maximo/ui/?event=loadapp&value=startcnc&uniqueid=2&uisessionid=4`. The user is logged in as Mike Wilson.

Navigation and Tools:

- Role: Maintenance Supervisor
- Buttons: Change Content Layout, Display Settings, Create New Template, Modify Existing Template, Update Start Center

My Maximo (Left Sidebar):

- Assets (Nuc)
- Corrective Actions (Nuc)
- Changes (Nuc)
- Clearances (Nuc)
- Commitment Tracking (Nuc)
- Locations (Nuc)
- Preventive Maintenance (Nuc)
- Quick Permits (Nuc)
- Quick Reporting (Nuc)
- Work Order Tracking (Nuc)
- Scheduler
- KPI List

Inbox / Assignments:

No Assignments found for **Mike Wilson**

Result Set:

Work Order	Description	Asset	Location	Priority	Scheduled Start	Status
1087	Request for OS upgrade to Windows XP			5		APPR

Bedford Unit 1 Health:

Last Run: 9/4/10 12:40 PM

Status KPI:

	Actual	Target	Variance
Bedford Unit 1 Average Age of the Corrective Maintenance Backlog	0	45	-45
Bedford Unit 1 On-Line Corrective Maintenance Backlog	0	20	-20
Bedford 1 On-Line Elective Maintenance Backlog	0	30	-30
Bedford Unit 1 Average Age of the Elective Maintenance Backlog	0	60	-60
Bedford Unit 1 Number of Grace Period PMs	0	15	-15
Bedford Unit 1 On-Line Material Condition Backlog	0	50	-50
Work Orders Overdue	433	15	418
Average Response Time for Emergency Work Orders	4.16	0.02	4.14
Open Work Orders Waiting Approval	131	25	106
PM Work Orders Overdue	355	5	350
Average Age of the Corrective Maintenance Backlog	0	0	0
Number of Grace Period PMs	0	0	0

Graphical View:

A bar chart showing the distribution of work orders. The x-axis represents the number of work orders (0, 433, 131, 355, 0) and the y-axis represents the count (0 to 400). The bars are colored red and green.

Maximo Nuclear Key Performance Indicators

- Eleven standard KPIs monitor performance of the modeled SNPM processes:
 - On-line Corrective Maintenance Backlog
 - On-line Elective Maintenance Backlog
 - On-line Material Condition Backlog
 - Average Age of Corrective Maintenance Backlog
 - Average Age of Elective Maintenance Backlog
 - Forced Outage Readiness
 - Number of Grace Period PMs
 - Backlog of Equipment-related Events Waiting to be Reviewed
 - Backlog of PM Feedback Waiting for Review
 - Average Age of Open Item Requests
 - Average Age of SSC-Related SRs Waiting Work Management Disposition

Clearances Reports

- Standard reports support implementing a single Clearance:
 - Clearances Tag Print
 - Tag information for the physical tag; keyed to the CL, Tag, and component
 - Clearance Configuration Change Order report
 - Smart report, adjustments based on current Clearance status
 - Clearance Configuration IV Order report
 - Smart report, adjustments based on current Clearance status
- Standard reports for managing the complete Clearances business cycle:
 - Clearances Needed report
 - WOs requesting Clearance protection by Ops
 - Open Clearances Index report
 - Tracking and management of the Clearance program
 - Tags in the Field report
 - Grouped by Unit and System, identifies tagged components and tagging data
 - Work Against Tagged Components report
 - Displays open WOs against tagged Locations and Assets; potential conflicts
 - Clearances Ready to Release report
 - Clearances no longer needed; ready for Ops to clear

Lineups Reports

- Standard reports to perform Lineups:
 - Lineup Execution Order report
 - Smart report, adjustments based on current Lineup status
 - Lineup Execution IV Order report
 - Smart report, adjustments based on current Lineup status

Condition Report Reports

- Condition Reports Review List
 - List report facilitates CRB screening of a group of CRs

Permits Reports

- All Permits and Permit Requests
 - By Type and Scheduled Start Date

Process Management Reports

- Four Process Management Reports:
 - Startup Management report – open Work Orders by Milestone
 - Work Management Review report – new System, Structure and Component requests/issues
 - On-Line Material Condition Backlog by Age
 - Equipment Issues Review List

Duty Station Reports

- Duty Stations Record Copy Print
 - Copy by shift for archiving or review

LCO Tracking Reports

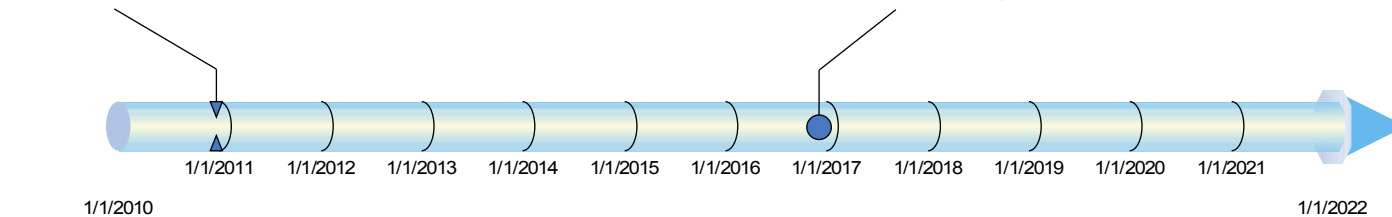
- LCO Tracking Management Report
 - Summary information describing the LCO and Action performance; available from the List tab for selective printing of multiple LCO records; supports archiving

Maximo Nuclear for New Plant Construction



xx/yy/2006
Project Kickoff

xx/yy/2017
Initial Criticality



1/1/2010
Commit

Engineering and Design
Station-specific Licensing

Construction

Startup

Commercial Operations >>>>>>>>>>

Plant components have a common lifetime database from early design definition and procurement, through plant startup / turnover to plant staff, and finally to full operational station EAM activities



• Purchasing module – Used for WH stocking and spares

• Purchasing module – Used for Plant Equipment replacement and operational stores

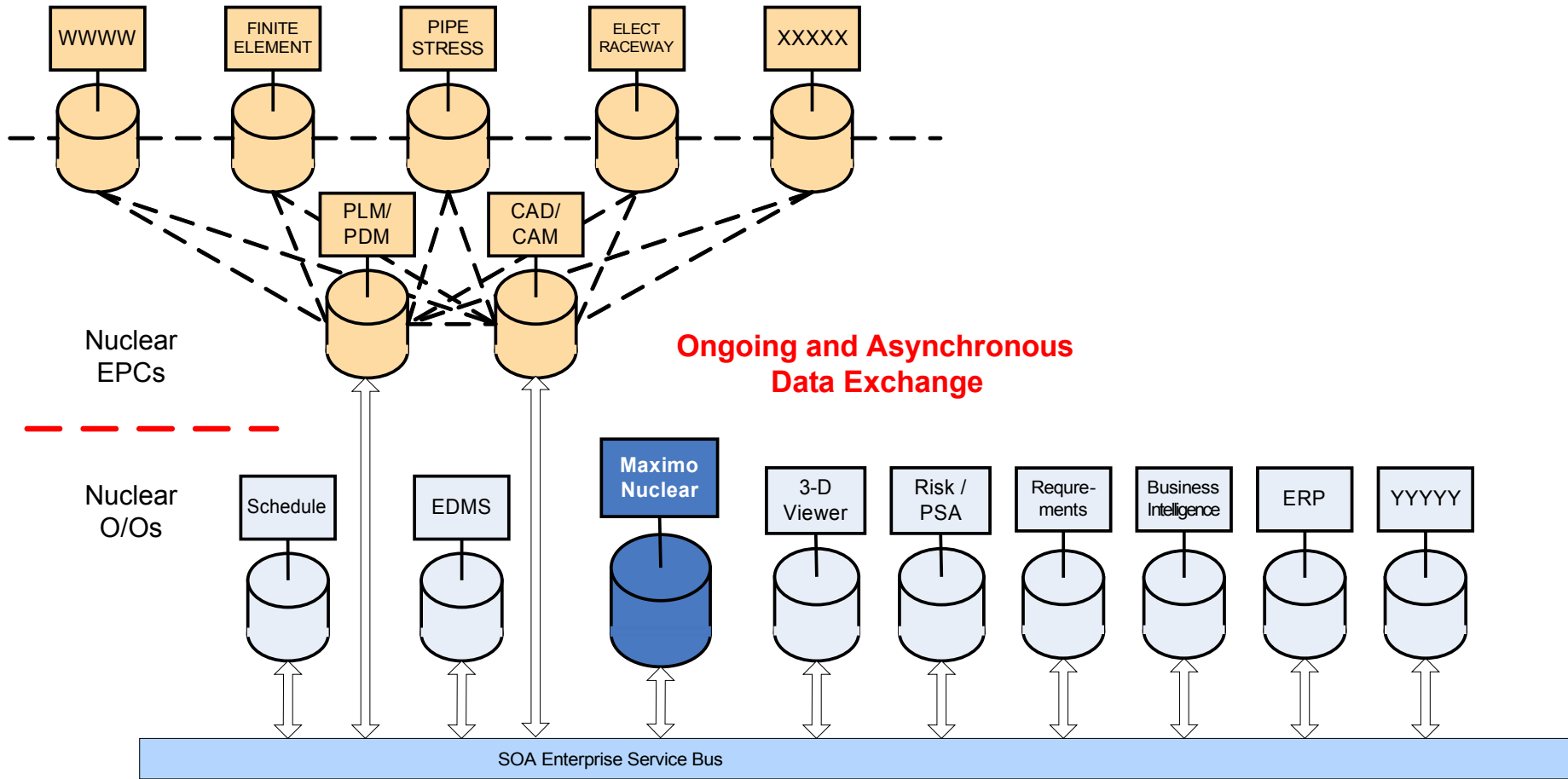
Construction completion tasking
• Inventory Module – Receipt, storage, and issuing for erection
• Preventive Maintenance module – Equipment PMs for turned-over components

• Inventory Module – Receipt, storage, and issuing of operational stores
• Preventive Maintenance module – Transitional to operational PMs and Surveillance Testing

PLUS
• Operational Management (Nuc) module – Clearances, operational and maintenance risk management (Impact Plans), SNPM workflow, Equipment Corrective Action, Tech Spec surveillances and compliance tracking
• Extended Corrective Actions module, Permits module – Functionality under development for VEGA release
• Resources module – Plant personnel assume operational responsibilities
• Service Desk module – Service Requests, Incidents, Problems and Activities

Maximo for Nuclear Plant Startup

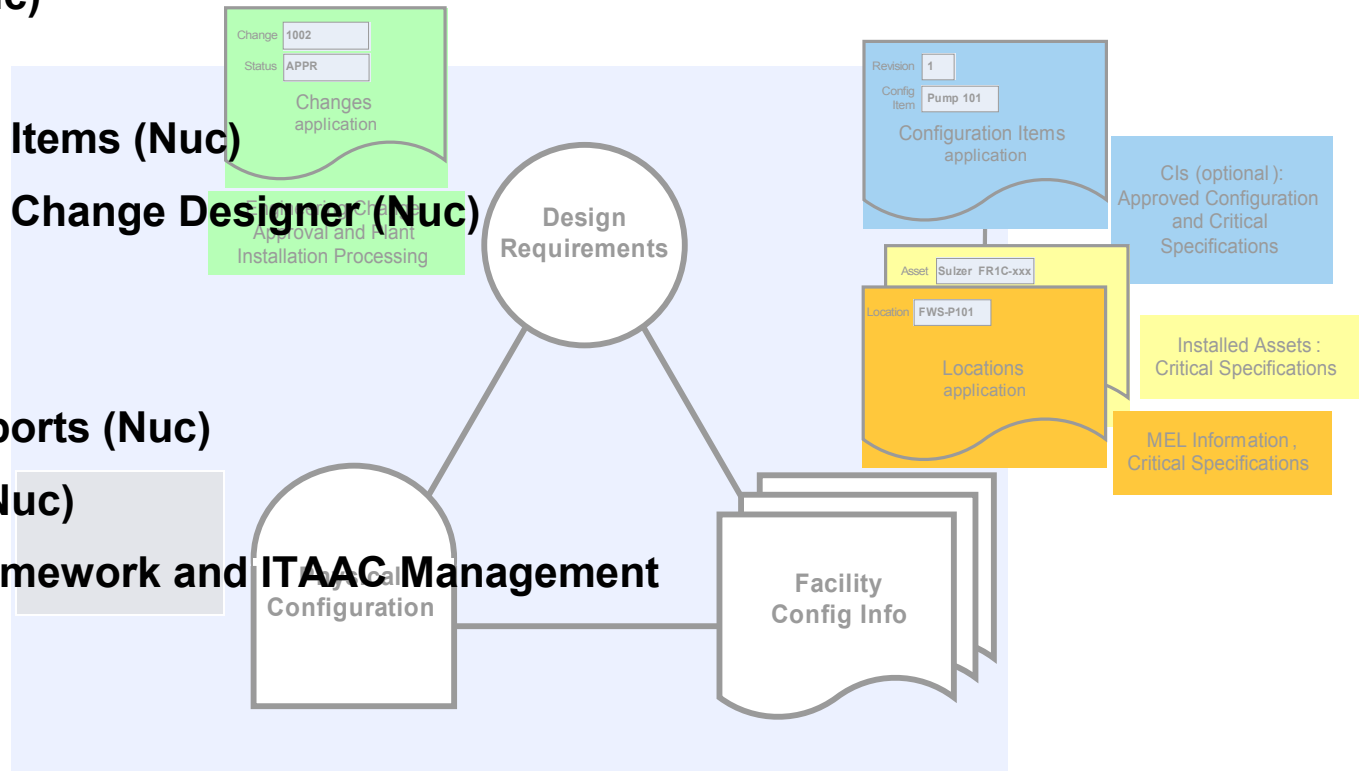
Conceptual Architecture



Key Configuration Management Tools Maintain Nuclear Data

- Maintain the integrity of the Configuration Management Model within Maximo

- Locations (Nuc)
- Assets (Nuc)
- Configuration Items (Nuc)
- Configuration Change Designer (Nuc)
- Change (Nuc)
- Release (Nuc)
- Condition Reports (Nuc)
- Work Order (Nuc)
- Tech Spec Framework and ITAAC Management



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