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## Driving Success: Unlocking SAP's 9 Phase Model for Asset Management in a successful S/4HANA implementation

**Presenter**

Brad Martin

Product Owner for Maintenance Work Management



# Brad Martin

## Digital Core Asset Management Program

### Product Owner SAP S/4HANA EAM for Maintenance Work Management



16 yrs experience O&G + 10 yrs Maint.

Prev. roles: Maintenance Planner, Scheduler, CMMS Coordinator

Masters of Maintenance and Reliability Engineering

Wheatstone and Gorgon ERP projects, ERP Upgrade

5 yrs Digital Transformation

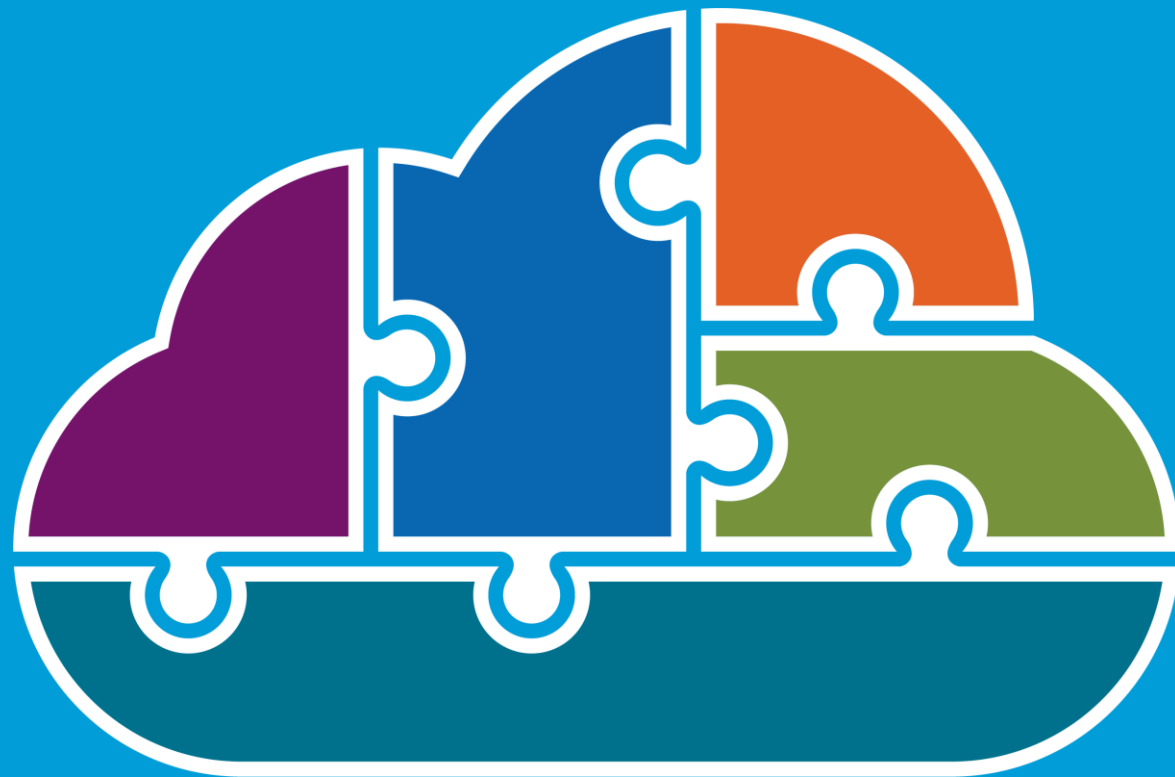
Energy and Natural Resources Consortium

April '23 deployment of SAP S/4HANA 2021 FPS01 private cloud

[Brad.Martin@Chevron.com](mailto:Brad.Martin@Chevron.com)

# Agenda

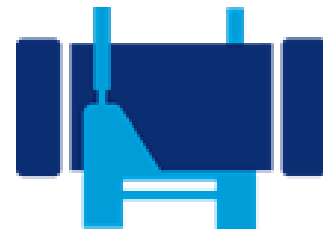
## 01



## Agenda

1. Chevron and Digital Core Program
2. SAP Phase Process for Work Management
3. First Release of SAP 2021 FPS01
4. Q&A

The oil and gas industry is undergoing a digital transformation that involves the integration of advanced technologies to enhance operational efficiency, safety, and productivity. This digital transformation is driven by the need to reduce costs, optimize production, and mitigate risks.



The World Economic Forum's [White paper](#) on "Digital Transformation Initiative Oil and Gas Industry" says that digitalization in the oil and gas sector holds the potential to unlock about \$2.5 trillion of value for its customers and the industry as a whole.

.



# Digital Transformation Asset Management : Vision

TODAY

TOMORROW

## Decentralized systems decisions

**Design:** Complex and highly customized – individual and instinct driven

**Operate:** Historical, Siloed and Operational based – lack of integration and visibility.

**Cost:** Multiple and proprietary solutions led to increase operating Cost (IT)

**Adoption:** Difficulties to enable cross discipline, solution and facilitates adoption

**Speed:** Challenges with process adoption and limitation of solution / technology Transformation

**Sustainability:** Lack standard, governance, process and data leads impact the system sustainability

## HOW DO WE GET THERE

### Digital Transformation

Master Data and Information

Industry Standard Process

Governance

Interactive, intuitive technology



Leadership Commitment



Change Management



Org Capabilities & Culture



Partnership

## Intercept the future stand

**Collaborative and Data driven:** Accessibility to critical data across enterprise

**Innovative:** Connected system with new capabilities to improve effectiveness, efficiency, and integration

Greater **Safety, Operation, Reliability & Integrity** with Near real-time, forward-looking, embedded analytics

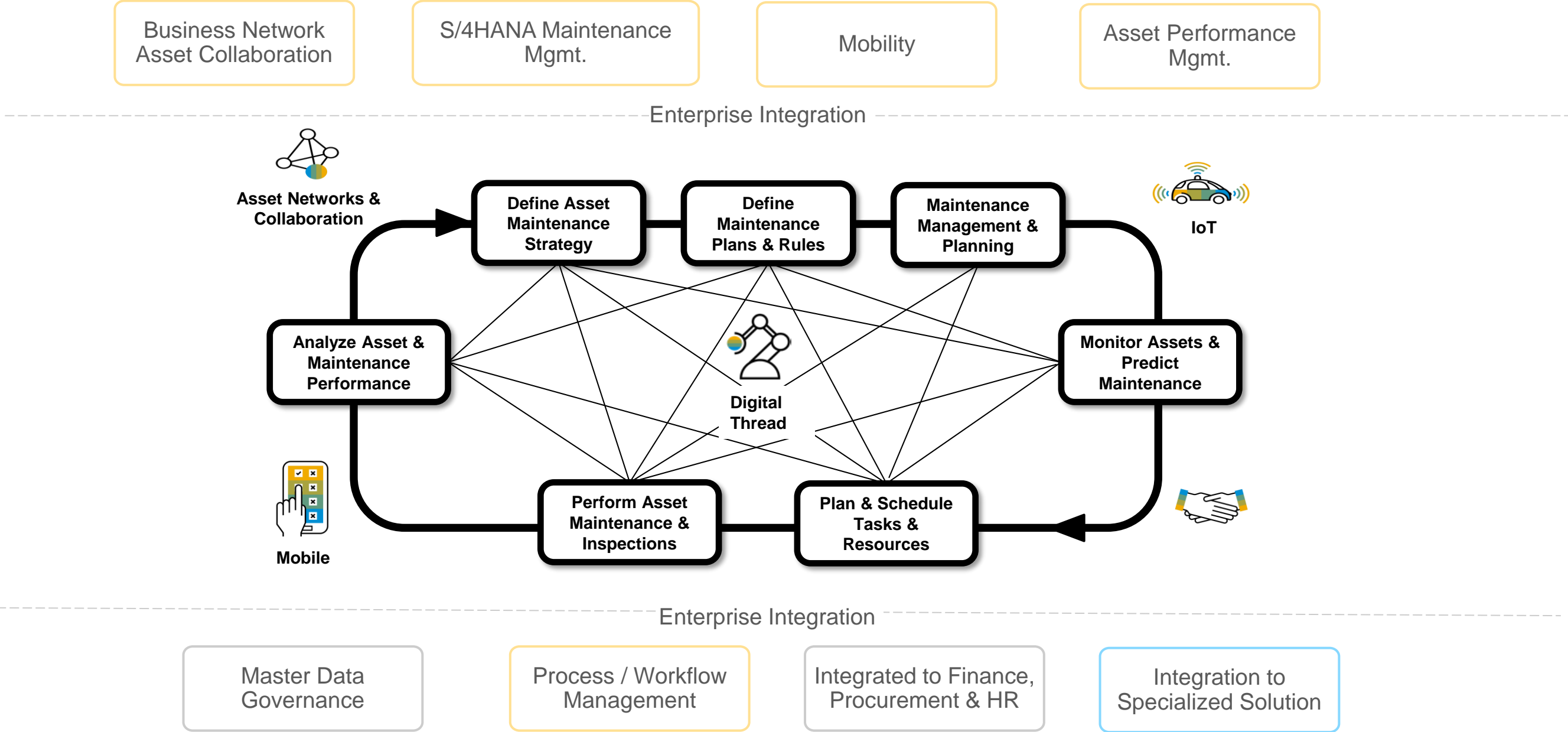
System simplicity speeds up **Decision-Making** and adapt to change quickly to deliver new business value

Standardized processes streamline service and product delivery – **cloud enabled**

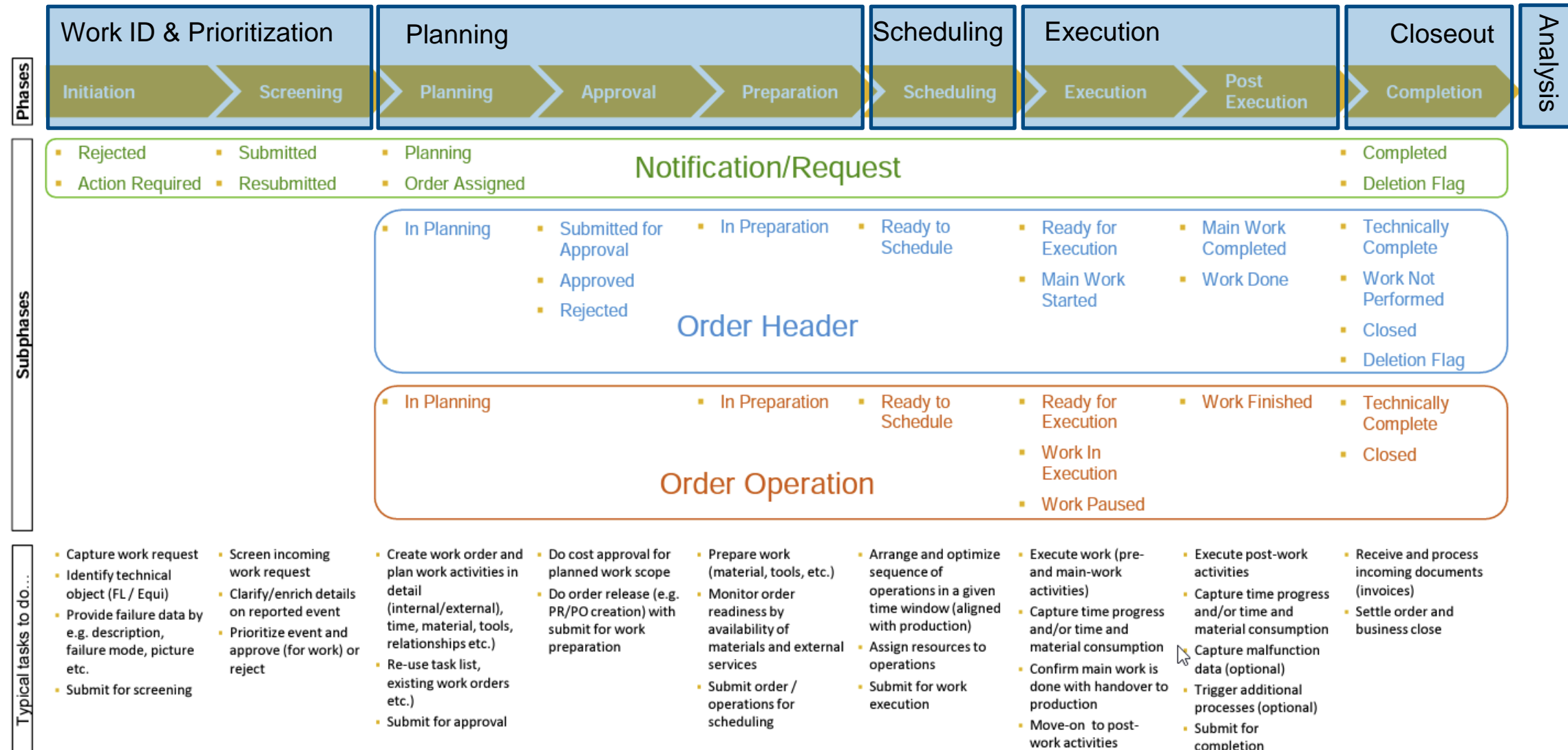
**Enable system sustainability and business growth**– with transition towards lower carbon energy source

# Integrated Asset Management Program

Seamlessly extend Enterprise Maintenance Management with Asset Performance Management along end-to-end processes to close the loop between maintenance strategy and execution to define, implement, execute and monitor the optimal asset maintenance

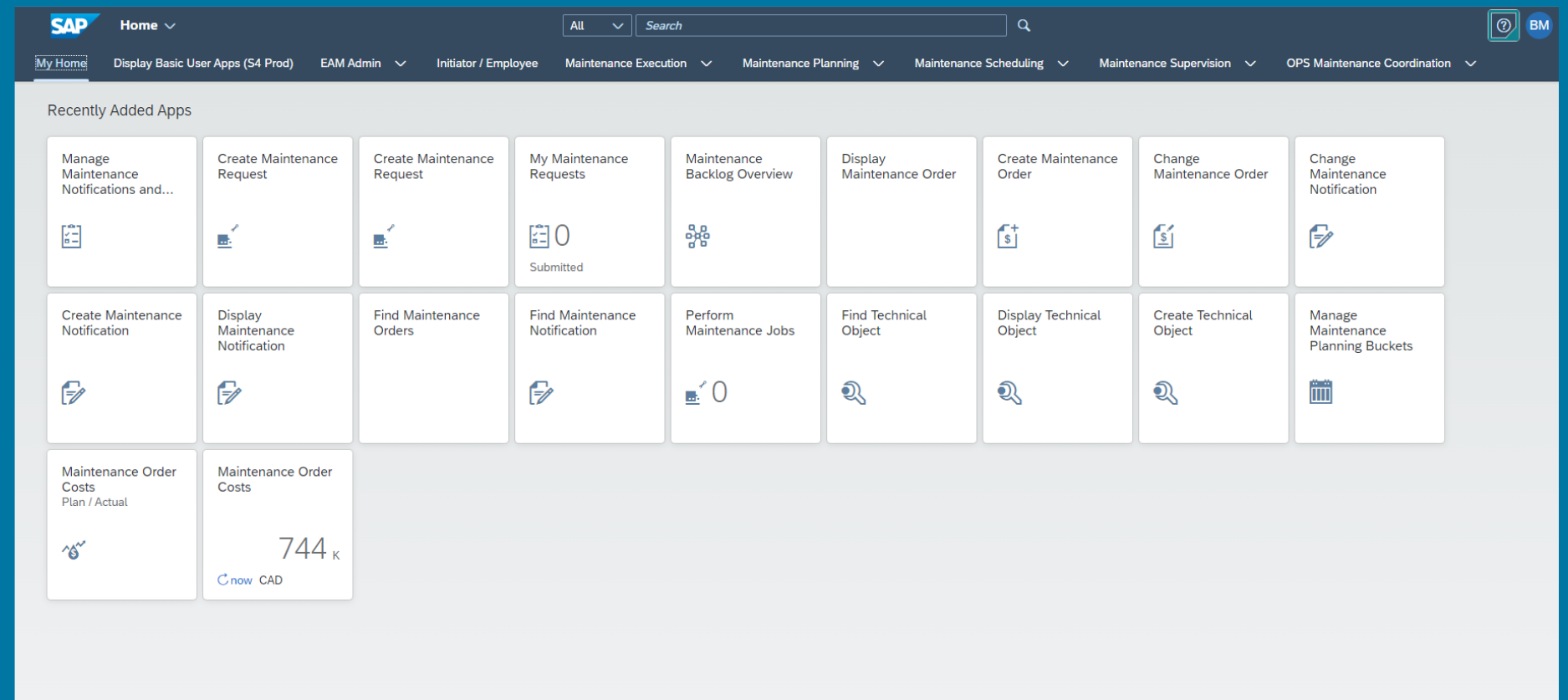


# SAP Best Practice 4HI & 4HH for Proactive and Reactive Maintenance – 9 Phase Process



# FIORI Landing Page

- Home Page
- Business roles
- Spaces and Pages
- Tiles
- Embedded Analytics





# 4HI Proactive Orders

- Process starts in APM
  - Define Asset Strategy
  - Implement to S/4HANA
  - Execution Planning
    - Labor
    - Materials
    - Support Documents
- Cost approval via MDG
- Orders created in Preparation Phase
  - Exceptions creating in Planning Phase

The screenshot displays two overlapping SAP S/4HANA screens. The background screen is titled 'Perform Maintenance Job' and shows details for a maintenance order (0010) related to a pressure vessel. The foreground screen is titled 'Record Inspection Results' and shows inspection characteristics for the same object.

**Perform Maintenance Job Screen:**

- Technical Object: 10000330 (Pressure Vessel)
- Order: Pressure Vessel - NDE (1000548)
- Order Type: Maintenance Order Inspection Checklists (PM07)
- Processing Context: Standard Order
- System Status: REL

**Record Inspection Results Screen:**

**Inspection Object:**

- Material: IDMS\_0001
- Plant: 0001
- Specifications: 90.0000 ... 91.0000 mm
- Inspection Lot: 890000000102
- Operation: Measure Thickness (0010)
- Equipment: CML002 of Zone Head (10000334)

**Inspection Characteristics Table:**

| Inspection Object                | Material  | Plant | Specifications                         | Inspection Result         | Result Details   | Status / Valuation      | Remark |
|----------------------------------|-----------|-------|--|---------------------------|--|-------------------------|--------|
| CML Thickness with limits (0010) | IDMS_0001 | 0001  | Specifications: 90.0000 ... 91.0000 mm | Mean Value (mm): 90.00000 | No. Above / Below: 0 / 0<br>Inspected / Nonc...: 1 / 0 | Processing Is Completed |        |
| Diameter (0020)                  | IDMS_0001 | 0001  | Specifications: 30.0000 ... 35.0000 mm | Mean Value (mm): 29.30000 | No. Above / Below: 0 / 1<br>Inspected / Nonc...: 1 / 1 | Processing Is Completed |        |

**Job Details Table:**

| Inspection Lot              | Plant | Characteristics              | Technical Object               |
|-----------------------------|-------|------------------------------|--------------------------------|
| EQU.10000333 (890000000100) | 0001  | 3 (Green), 1 (Red)           | CML001 of Zone Head (10000333) |
| EQU.10000335 (890000000101) | 0001  | 1 (Grey)                     | CML003 of Zone Head (10000335) |
| EQU.10000334 (890000000102) | 0001  | 1 (Green), 2 (Red), 1 (Grey) | CML002 of Zone Head (10000334) |

# Initiation Phase

## Create Maintenance Request FIORI App

- Quality Maintenance Request
- Assign correct equipment and check for duplicates
- Failure mode group and codes ISO14224
- Description field mandatory, Enable Now Help
- Key User Extensibility additional fields
- Long text template
- Assess Priority: Likelihood + Consequence matrix
- Starting to build failure profile
  - Understand what is required
  - When it should be done by
  - Failure data profile

New Maintenance Request

Technical Data

*The technical object you selected is also associated with 2 maintenance requests.*

Technical Object: Valve,Control,Test Separator Water Dump (100008811)

Location: 13-02-062-19W5 (13026219)

Current Location: Enter current location of technical object

Failure Mode Group: Globe (VAGL)

Failure Mode: Failure to Function on Demand (F017)

Detection Method: Periodic Maintenance Scheduled Activities

Effect: No effect (1)

Breakdown: ☐

Malfunction Start Date: 10/19/2023, 12:33:57

General Data

Description: \* Enter a title for the maintenance request

Deviation No.:

Estimated Daily Failure Impact:

Template: Maintenance Notif. Long Text template

Long Text: Work Request Template

DESCRIBE THE FAULT:

WHY THE FAULT OCCURED (IF KNOWN):

HOW COULD THE FAULT BE RECTIFIED (IF KNOWN):

Priority: Select a priority Assess Priority

# Screening Phase

## Screen Maintenance Request FIORI App

- Prevent defects from entering the system to avoid bottlenecks
- Only accept Quality requests / send back for more information
- Reject duplicates
- Confirm assigned Priority
  - If everything is urgent then nothing is urgent

The screenshot displays the SAP Maintenance Request Fiori App interface. At the top, the title bar shows 'SAP Maintenance Request' with a search icon, a help icon, a notification bell, and a user profile icon labeled 'BM'. Below the title bar, the main content area shows a defect entry '10000751' with the description 'Defect at Inspection 890000000457'. To the right of the defect number are buttons for 'Edit', 'Accept', 'Reject', 'Action Required', and 'Determine Output Items'. The interface is divided into several sections: 'Overview' (Notification Type: Y1, Order: Phase: Screening, Subphase: Submitted (Request), Notification Processing Context: —), 'Identified Asset' (Technical Object: IA-TPT-IPPS-100 Pressure transmitter (10000961), Identifying Level: —, Failure Mode Group: —, Failure Mode: —, Effect: —), and 'Dates' (Malfunction Start Date Time: —, Malfunction End Date Time: —, Required Start Date Time: 07/21/2023, 10:13:17, Required End Date Time: —, Final Due Date: —). Below these sections is the 'Responsible Area' section, which includes 'Breakdown' (No) and 'Priority'. The 'Responsible Area' section also lists 'Planning Plant: TAHITI PLATFORM (R210)', 'Planner Group: Maintenance (100)', 'Main Work Center: Mechanic R210 (MECH)', 'Work Center Plant: TAHITI PLATFORM (R210)', and 'Person Responsible: —'. At the bottom, there are tabs for 'General Information', 'Malfunction Information', 'Maintenance Plan Details', and 'Output Items'. The 'General Information' tab is currently selected, showing 'Technical Information' (IC-Ranking: —, IC-Relevant: —, Technical Object: IA-TPT-IPPS-100 Pressure transmitter (10000961)), 'Location Data' (Maintenance Plant: —, Current Location: —, Location: —), and 'Responsible Area' (Planning Plant: TAHITI PLATFORM (R210), Planner Group: Maintenance (100), Main Work Center: Mechanic R210 (MECH)).

# Planning Phase

## Manage Orders and Notifications FIORI App

- Ensure all foreseeable delays to executing maintenance are addressed upfront to ensure efficient use of resources
- Create Order to go with Notification
- Add operations to identify
  - What work center do we need
  - How many do we need
  - How long do we need them for
- Include support services such as scaffolding or cranes
- Materials
- Documents Infor Records DIRs

The screenshot displays the SAP Fiori app interface for 'Change Reactive Maintenance: 200006934'. The top navigation bar includes 'Read Only', 'Check Entries', 'Change Status', 'Additional Functions', and 'You can also'. The main header shows the order details: Order: 200006934, Description: 6-35 air receiver auto dump not working, Order Type: YA01, Reactive Maintenance, Technical Object: 100014384, Priority: Medium, System Status: CRTD MANC NMAT NTUP ORAR PRO, Phase: Planning, Subphase: In I.

The 'General Data' tab is selected, showing the following information:

- Long Text:** 09/13/2023 17:04:14 UTC (12407161) Work Request Template. DESCRIBE THE FAULT: auto dump valve off receiver is stuck open and is manual blocked in unit we can get it changed. need to go to location and see if it is 1/2" or 3/8" NPT. marked it high cause the auto drain is blocked in and there is potential for water getting into the dryer and carrying into the air system. WHY THE FAULT OCCURED (IF KNOWN):
- General Data:**
  - Description: 6-35 air receiver auto dump not working
  - Required Start: 11/21/2023 07:00:00
  - Scheduled Start: 09/25/2023 07:00:00
  - Previous Final Due Date: 10/28/2023
  - Technical Object: 100014384 Compressor, Instrument Air
  - Identifying Assets: Kaybob Duvernay / ... / Compressor, Instrument Air
  - Serial Number:
  - System Condition: In Operation
- Priority:** Medium
- Required End:** 11/22/2023 07:00:00
- Scheduled End:** 09/25/2023 07:00:00
- Final Due Date:** 11/28/2023
- Technical Object Type:** Equipment
- Material:**
- Assembly:**
- Assigned Notification:** 100006942 6-35 air receiver auto dump not working
- Maintenance Activity Type:**
- Task List:** Assign Task List
- Has Open Main Work:** ☒
- Estimated Daily Failure Impact:**



# Approve Maintenance

## My Inbox FLORI App

- Planned cost of Maintenance activity now available
- Tiered Approval structure
  - 1<sup>st</sup> Auto Approved
  - 2<sup>nd</sup> Supervisor
  - 3<sup>rd</sup> Manager
- Support Maintenance Budget Management
- Manage higher cost jobs by exception

The screenshot displays the 'Workflow Details' page for the 'CBU Work Order Approval Workflow'. The page includes a description, validity dates, start conditions, and a table of workflow steps.

**Workflow Details**

[Workflow for Maintenance Order](#)

CBU Work Order Approval Workflow

Properties | Start Conditions | Steps

Description:  
CBU Work Order Approval Workflow

Valid from:  
03/21/2023

Valid to:  
12/31/9999

Show More

Start Conditions

Only start the workflow if all of the following preconditions are met:  
Planning plant of the maintenance order is

Steps

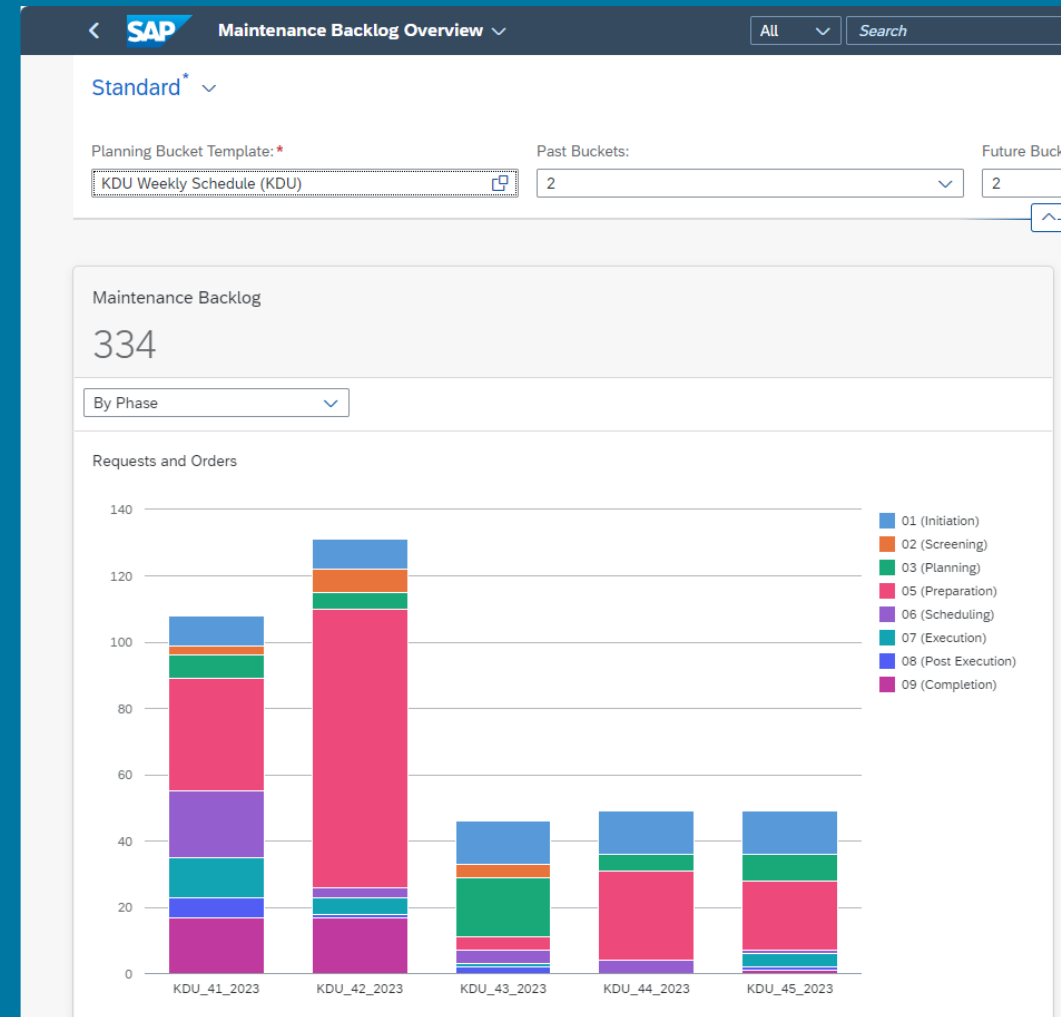
Workflow Steps

| Type | Name                                       | Recipients               | Step Conditions   |
|------|--|--------------------------|---|
| ⚙️   | 1. Automatic Approval of Maintenance Order | Determined automatically | Total planned cost is less than 25,001.00 CAD >                 |
| 👤    | 2. Level 1 - Cost Approval (>=25001 CAD)   | Cost Approval Level 1    | Total planned cost is greater than or equal to 25,001.00 CAD >  |
| 👤    | 3. Level 2 - Cost Approval (>= 100000 CAD) | Cost Approval Level 2    | Total planned cost is greater than or equal to 100,000.00 CAD > |
| 👤    | 4. Level 3 - Cost Approval (>=500000 CAD)  | Cost Approval Level 3    | Total planned cost is greater than or equal to 500,000.00 CAD > |

# Preparation Phase

## Maintenance Backlog Overview FIORI App

- New feature Planning Buckets
  - Define bucket duration e.g., week
  - Group and manage work within the bucket
  - Graph shows bucket and phase
  - Click on phase to drill into app to action



# Preparation Phase

## Manage Maintenance Backlog FLORI App
















- Drill into weekly bucket of orders in preparation phase
- Manage by exception to progress to next phase
- Traffic lights to highlight potential issues
  - Schedule dates to Final Due Date FDD
  - Materials and services availability
  - Ready to schedule indicator
- Adjust dates or initiate expediting for exceptions

KDU\_44\_2023  
KDU Weekly Schedule

Planning Plant: 1000    Start Date and Time: 10/29/2023, 01:00:00    Maintenance Plant: Kaybob Duvernay (1000)  
End Date and Time: 11/05/2023, 01:00:00  
Duration: 7 Days

Orders   Stock Components   Non-Stock Components   Services   Resources

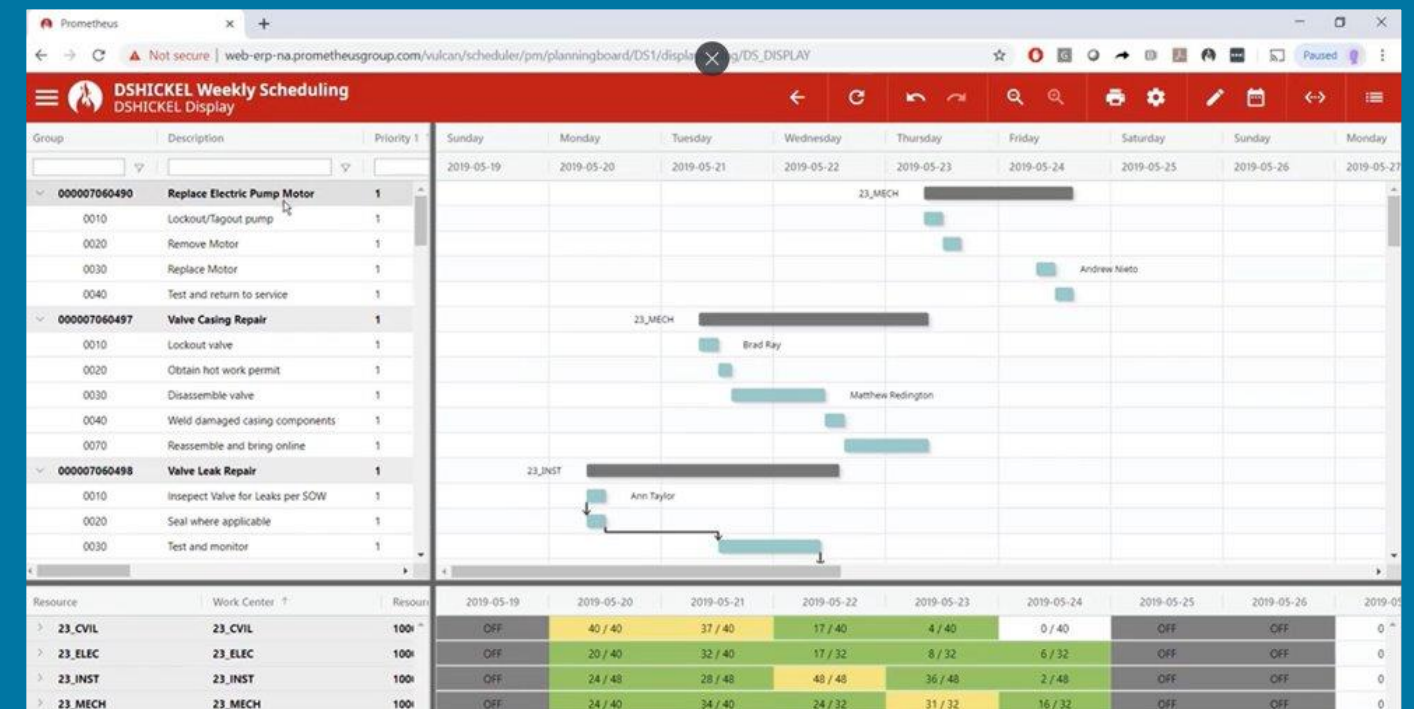
Maintenance Orders (80) | Standard ▾ | All Orders | Orders In Preparation

| <input type="checkbox"/> Order  | Order Type                   | Status  |
|---|------------------------------|---|
| <input type="checkbox"/> Liquid Meter: Smart Meter Verification (200003517) | Proactive Maintenance (YA02) |  <input type="radio"/> <input type="radio"/>   |
| <input type="checkbox"/> 11-28 10AI1065 Description (200003650)             | Reactive Maintenance (YA01)  |  <input type="radio"/> <input type="radio"/>   |
| <input type="checkbox"/> 07-05 condy flow meter. (200003675)                | Reactive Maintenance (YA01)  |  <input type="radio"/> <input type="radio"/>   |
| <input type="checkbox"/> 10-33 Sep 5-10 unit heater repair (200003676)      | Reactive Maintenance (YA01)  |    |
| <input type="checkbox"/> 04-19 Separator 110 Downsize Vcone (200003781)     | Reactive Maintenance (YA01)  |   <input type="radio"/>   |
| <input type="checkbox"/> 04-19 Separator 510 Downsize Vcone (200003782)     | Reactive Maintenance (YA01)  |   <input type="radio"/>   |
| <input type="checkbox"/> 04-19 Separator 310 Downsize Vcone (200003784)     | Reactive Maintenance (YA01)  |   <input type="radio"/>   |
| <input type="checkbox"/> 01-17 Downsize V-Cone 1057 (200003853)             | Reactive Maintenance (YA01)  |   <input type="radio"/>   |
| <input type="checkbox"/> Liquid Meter: Smart Meter Verification (200005060) | Proactive Maintenance (YA02) |  <input type="radio"/> <input type="radio"/>   |

# Scheduling Phase

## Prometheus

- Ensure the most efficient use of resources is achieved for the schedule period
- Seamless certified integration
- Strong planning and scheduling leads to
  - More work completed from the same resources
  - Improves Reliability of the operation

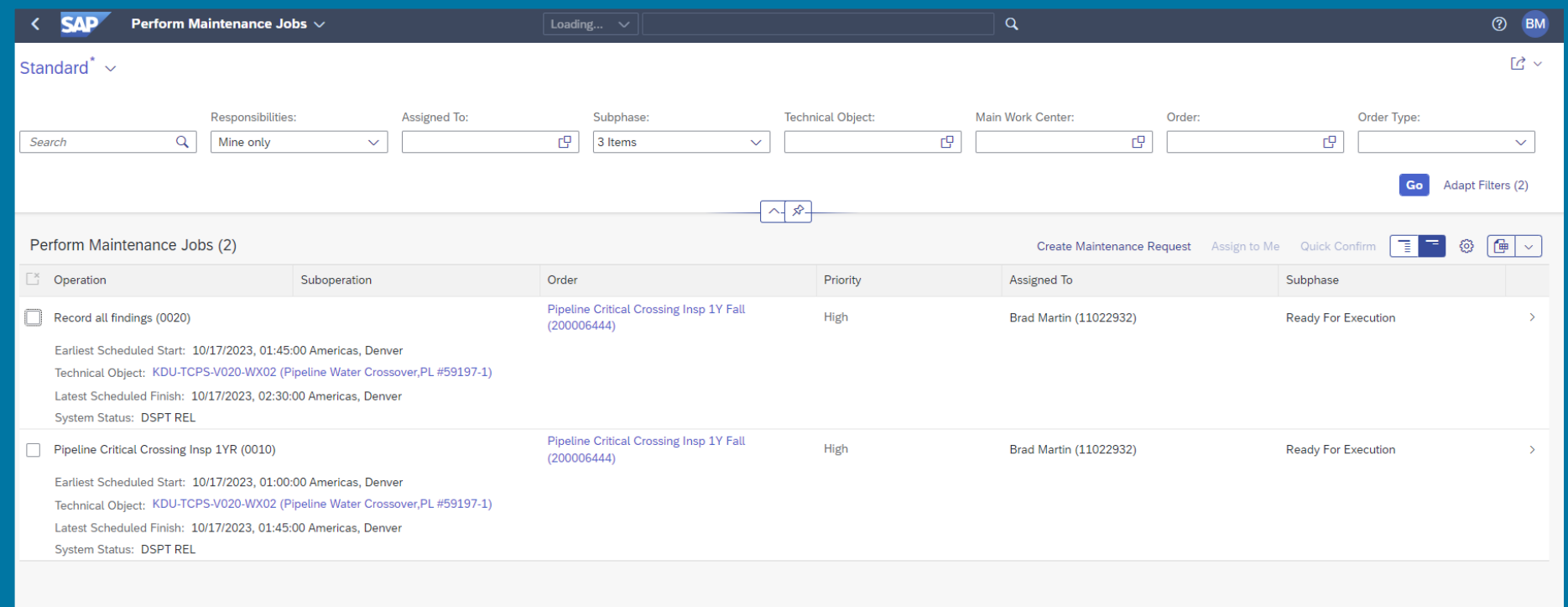




# Execution Phase

## Perform Maintenance Job FLORI App

- PMJ provides list of assigned work for crew and individual
- Start / Pause work as needed
- Add malfunction details to Notification for Reactive work
- Complete checklists for Proactive work
  - Qualitative / Quantitative data
  - Measurement points / readings
- Mark work done
- Add time confirmations



| Operation  | Suboperation | Order   | Priority | Assigned To            | Subphase            |
|--|--------------|---|----------|------------------------|---------------------|
| <input type="checkbox"/> Record all findings (0020)<br>Earliest Scheduled Start: 10/17/2023, 01:45:00 Americas, Denver<br>Technical Object: KDU-TCPS-V020-WX02 (Pipeline Water Crossover,PL #59197-1)<br>Latest Scheduled Finish: 10/17/2023, 02:30:00 Americas, Denver<br>System Status: DSPT REL                 |              | Pipeline Critical Crossing Insp 1Y Fall (200006444) | High     | Brad Martin (11022932) | Ready For Execution |
| <input type="checkbox"/> Pipeline Critical Crossing Insp 1YR (0010)<br>Earliest Scheduled Start: 10/17/2023, 01:00:00 Americas, Denver<br>Technical Object: KDU-TCPS-V020-WX02 (Pipeline Water Crossover,PL #59197-1)<br>Latest Scheduled Finish: 10/17/2023, 01:45:00 Americas, Denver<br>System Status: DSPT REL |              | Pipeline Critical Crossing Insp 1Y Fall (200006444) | High     | Brad Martin (11022932) | Ready For Execution |

# Post Execution Phase

## Perform Maintenance Job FLORI App

- Operations stage
  - Pre-work activity
  - Main-work activity
  - Post-work activity
- Enable identify when “Main-work” is complete
- Identify remaining “Post-work” to be completed

Order: 200007046 Description: TT1 Order Type: YA01, Reactive Maintenance Technical Object:

| General Data   | Location Data | Organizational Data | Operation Data | Object List | Costs  | Doc                 |
|--|---------------|---------------------|----------------|-------------|--------|---------------------|
| Operations   |               |                     |                |             |        |                     |
| <div>▼   <a href="#">New</a> <a href="#">Delete</a> <a href="#">Copy</a> <a href="#">Assign Task List</a> <a href="#">Create Task List</a></div> |               |                     |                |             |        |                     |
| <input type="checkbox"/>   | Work Ce...    | Activity ...        | Operat... ⌵    | Status      | Stage  | Description         |
| <input type="checkbox"/>   | 2005          | LRMC01              | 0010           | CRTD        | PRE ▼  | Install Scaffolding |
| <input type="checkbox"/>   | 1002          | LRMJ01              | 0020           | CRTD        | MAIN ▼ | Carry out Repair    |
| <input checked="" type="checkbox"/>  | 2005          | LRMC01              | 0030           | CRTD        | POST ▼ | Remove Scaffolding  |
| <input type="checkbox"/>   |               |                     |                |             | MAIN ▼ |                     |
| <input type="checkbox"/>   |               |                     |                |             | MAIN ▼ |                     |

# Completion Phase

## Maintenance Backlog Overview FIORI App

- Final quality review
  - Ensure physical work is completed and equipment back online
  - Ensure “paperwork” completed
- TECO Order
- Set clock for business close batch job

The screenshot displays the SAP Fiori app interface for 'Change Proactive Maintenance: 200000016'. The 'Change Status' dropdown menu is open, showing options such as 'Submit for Approval', 'Release', 'Ready to Schedule', 'Cancel Ready to Schedule', 'Main Work Completed', 'Cancel Main Work Completed', 'Complete (Technically)', 'Cancel Technical Completion', 'Complete (Business)', 'Cancel Business Completion', 'Do not execute', 'Cancel do not execute', 'Lock', 'Unlock', 'Set Deletion Flag', and 'Reset Deletion Flag'. The 'Complete (Technically)' option is highlighted. The background shows the 'General Data' tab with fields for 'Order: 200000016', 'Description', 'Subphase: Work Done (O', 'Location Data', 'Object List', 'Switches and Tx's TRAIN 1', 'Technical Object: KDU-W219', 'Identifying Assets: Kaybob Duvernay', 'Serial Number', and 'System Condition: Unit / Pad Outage'.



# Canada Business Unit Kaybob Duvernay

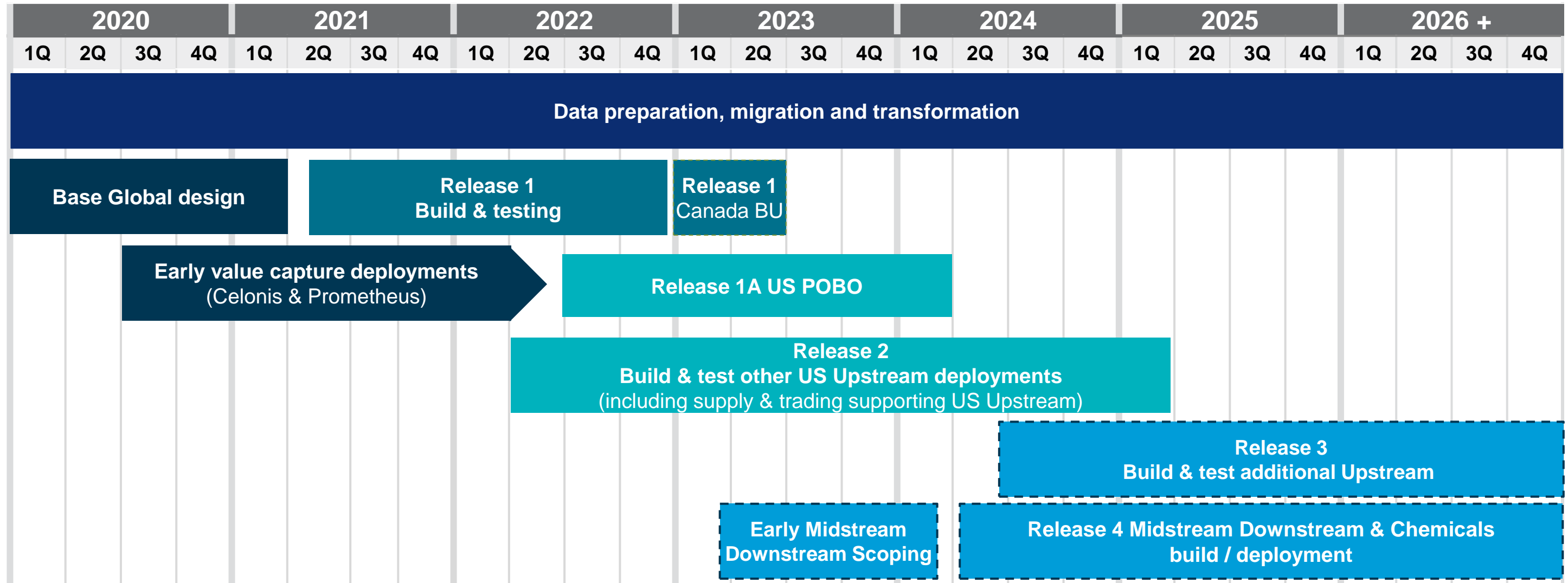
500 kms north of Calgary  
Relatively small asset  
Non-complex nature of operation  
Smaller field staff  
Close to Houston  
Great MVP location





# Digital Core program high-level timeline

Revised: May 2023



- Multi-year design and release program
- Functions deployed for Asset Management, Materials Management and Finance including MDG
- Clean core concept and go out of the box as much as possible – R1 **85% FIT to Standard**

# Digital Core Release 1 Lessons learned



## what went well



**One Team Behavior:** strong collaboration between the project team, IT platforms, and business unit & shared services



**Organization:** functional leadership unified by release management



**MVP Approach:** deployed subset of core processes to a single Business Unit to validate solution design and deployment approach

## what can be improved

**End to End process design:** Siloed design and build decisions led to sub optimal end to end processes



**Scalability:** Streamline ways of working across all program threads



**Change Management:** Stronger partnership with global process owners and business units



Q&A

