Electronic Permitting

2023 Prometheus User's Conference

Richard Bass

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Richard Bass

- Kuraray EVAL HSES Manager

- Chairperson of the Houston Business Roundtable

- Chairperson of the Texas Chemical Council EHS Seminar Committee

- Vice Chair of the Texas Chemical Council Occupational Safety Committee

- Vice Chair of the LaPorte, Morgan's Point, Shoreacres LEPC

- Consultant to the La Porte Plant Managers Network

- Texas Safety Foundation board member

- San Jacinto College CPET EHS advisory board

- Kuraray EVAL ePAS project manager
  - Permitting
  - LOTO

Kuraray at a glance

Kuraray America, Inc. is a global leader in specialty chemical, fiber and resin production. With top-of-the-line research and production facilities located in Houston, Texas, and a vast network of supply from around the world, Kuraray leads the industry in specialty dental, fiber, resin, and elastomer products.

Kuraray's Main Product Categories

Vinyl Acetate Derivates

Isoprene Chemicals

Functional Materials

Fibers and Textiles

Responsible Care®
OUR COMMITMENT TO SUSTAINABILITY

Kuraray's Roots

Responsible Care®
OUR COMMITMENT TO SUSTAINABILITY

What's the origin of Kuraray?

Est. 1926

Kura…

is the Japanese word for warehouse,
and Kuraray was established in Kurashiki

…ray

the viscose fiber **ray**on
was the first Kuraray product

Kuraray

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Responsible Care®
OUR COMMITMENT TO SUSTAINABILITY

Kuraray's Mission

We are committed to developing new fields of
business using pioneering technology that improves
the environment
and enhances the quality of life throughout the world.

For people and the planet.

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Project Background

- **Prior to ePAS Permitting**
  - All permits were done on carbon copy paper
  - 3 types of permits
    - Cold Work (PTW)
    - Hot Work
      - Same permit but separated into 2 types
        - Type A – High Energy
        - Type B – Low Energy
    - Confined Space
      - Not a stand-alone permit, must be accompanied by PTW or Hot Work permit.
  - LOTOs were paper based
    - Isolation plans were on a protected drive
    - Active isolation plans kept in LOTO room in file cabinets
    - Access to filing cabinets required restricted access to LOTO room
    - No historian of LOTOs
    - Lack of communication between contractors and operations when job is complete and ready to return to service

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Goals with Electronic Permitting
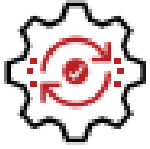
Standardize permit practices according to your company workflows.

Gain consistency and efficiency and reduce human error with HIRA (Hazard Identification and Risk Assessment).

Create consistency and efficiency with intelligent templating.
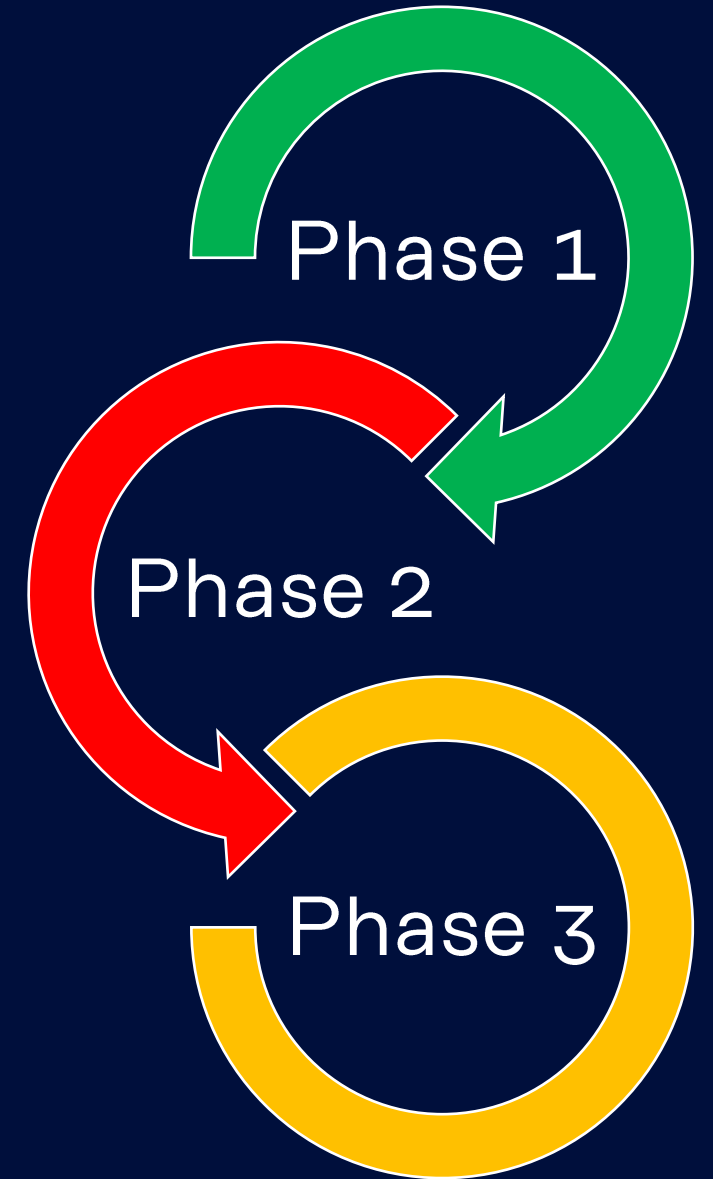
- **Standardized**
- **Consistency**
- **Efficiency**

Equals a Safer Permitting Process

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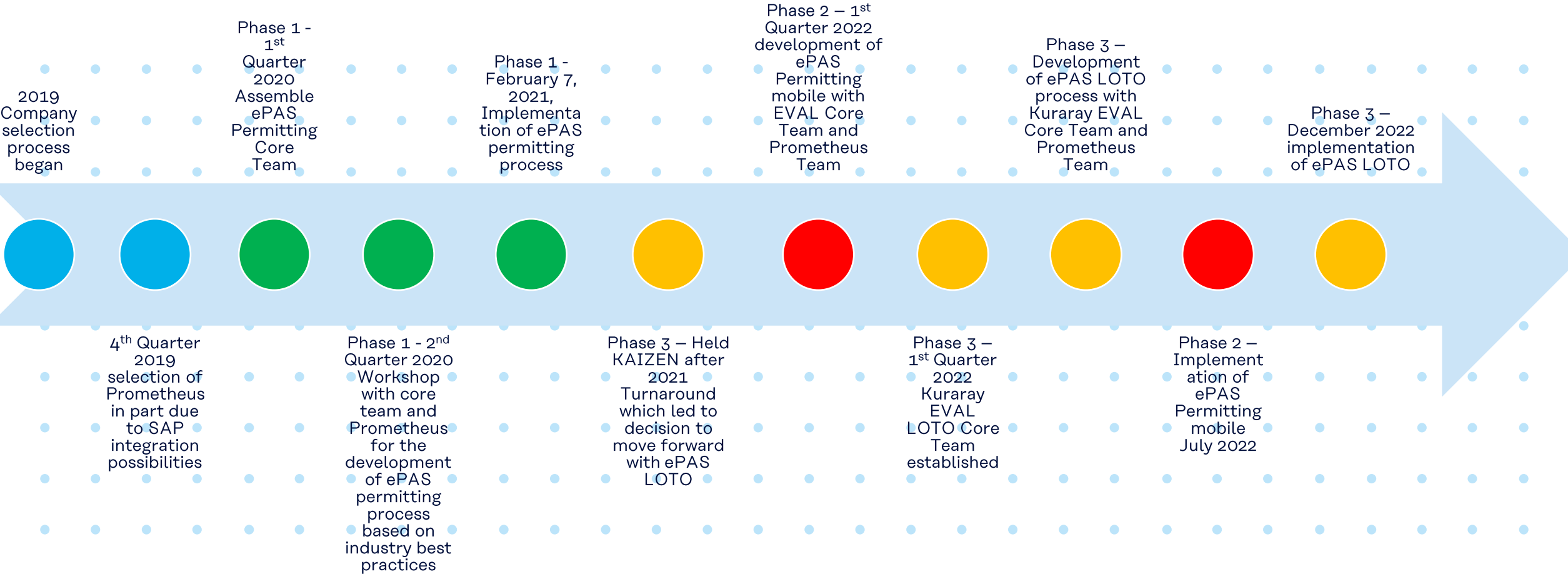
Permitting and Safety

- ePAS (Electronic Permit Administration System) is a web-based solution that is an integrated safe system of work.

- It is more than just work permitting. ePAS also manages isolations/LOTO (lock-out tag-out), handles risk assessment, and integrates with SAP.

- The ePAS Mobile application works online or offline, allowing users to continue with their safe work processes no matter what their connectivity is.

- More than compliance, designed to be "Industry Best Practice"

3 Phase Approach for Project

- Phase 1 - Implementation of ePAS permitting
  - Printed PDF permits written in ePAS
- Phase 2 – Implementation of ePAS permitting mobile
  - Hybrid – nested contractors vs third party
- Phase 3 – Implementation of ePAS LOTO

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Phase 1

Phase 2

Phase 3

Timeline of Kuraray EVAL ePAS Project

2019 Company selection process began

4th Quarter 2019 selection of Prometheus in part due to SAP integration possibilities

Phase 1 - 1st Quarter 2020 Assemble ePAS Permitting Core Team

Phase 1 - 2nd Quarter 2020 Workshop with core team and Prometheus for the development of ePAS permitting process based on industry best practices

Phase 1 - February 7, 2021, Implementation of ePAS permitting process

Phase 3 — Held KAIZEN after 2021 Turnaround which led to decision to move forward with ePAS LOTO

Phase 2 — 1st Quarter 2022 development of ePAS Permitting mobile with EVAL Core Team and Prometheus Team

Phase 3 — 1st Quarter 2022 Kuraray EVAL LOTO Core Team established

Phase 3 — Development of ePAS LOTO process with Kuraray EVAL Core Team and Prometheus Team

Phase 2 — Implementation of ePAS Permitting mobile July 2022

Phase 3 — December 2022 implementation of ePAS LOTO

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ePAS Permitting Process

Permit Creation

Electronic permitting allows for permit creation in multiple ways

- SAP Integration
- Templates
- Ad hoc

Follows a process flow

- Initial State
- Review
- Field Walkdown
- Verified and Active
- Work Complete
- Permit Complete

PTW FAC-PTW-22-287

INITIAL STATE | REVIEW | FIELD WALKDOWN | VERIFIED & ACTIVE | WORK COMPLETE | PERMIT COMPLETE

Site

UNIT

AREA

General Details

Plant Items

HIRA

Relationships

Documents

Details

Lock Box #

76

Issued To (Company) *

Turner

Issued To (Person) *

John Smith

Permit Initiated By *

Richard Bass (richard.bass@kuraray.com)

Work Description *

Job scope goes in this location. Should be part of job package. For SAP integrated jobs it is auto populated.

Date *

March 22, 2022 07:15

Date Finish *

March 22, 2022 17:30

Work Order #

90099893

Work Group *

Boilermaker

☐ Is this Project Work?

☐ Is this Third Party?

☐ Will atmospheric monitoring be required?

☐ Is an MOC required?

Outage

Plot Location

15

Hazard Identification Risk Assessment

HRP

Permit Verifications

Additional Verifications if Applicable

HRP Verifications

Permit Approvals and Verifications

Permit Verified By Owning Department *

Permit Verified By Owning Department Signature *

Permit Verified By Affected *

Permit Verified By Affected Signature *

Kuraray I&E Signature

DCS Approval

DCS Approval Signature

Bottle Watch

Bottle Watch Signature

HRP Questions

What is the Job? *

What Energy is Involved? *
- [ ] Motion
- [ ] Chemical
- [ ] Radiation
- [ ] Electrical
- [ ] Gravity
- [ ] Heat and Cold
- [ ] Biological
- [ ] Pressure

Where is the Energy going? *

How will we manage the energy for a safe job outcome? *
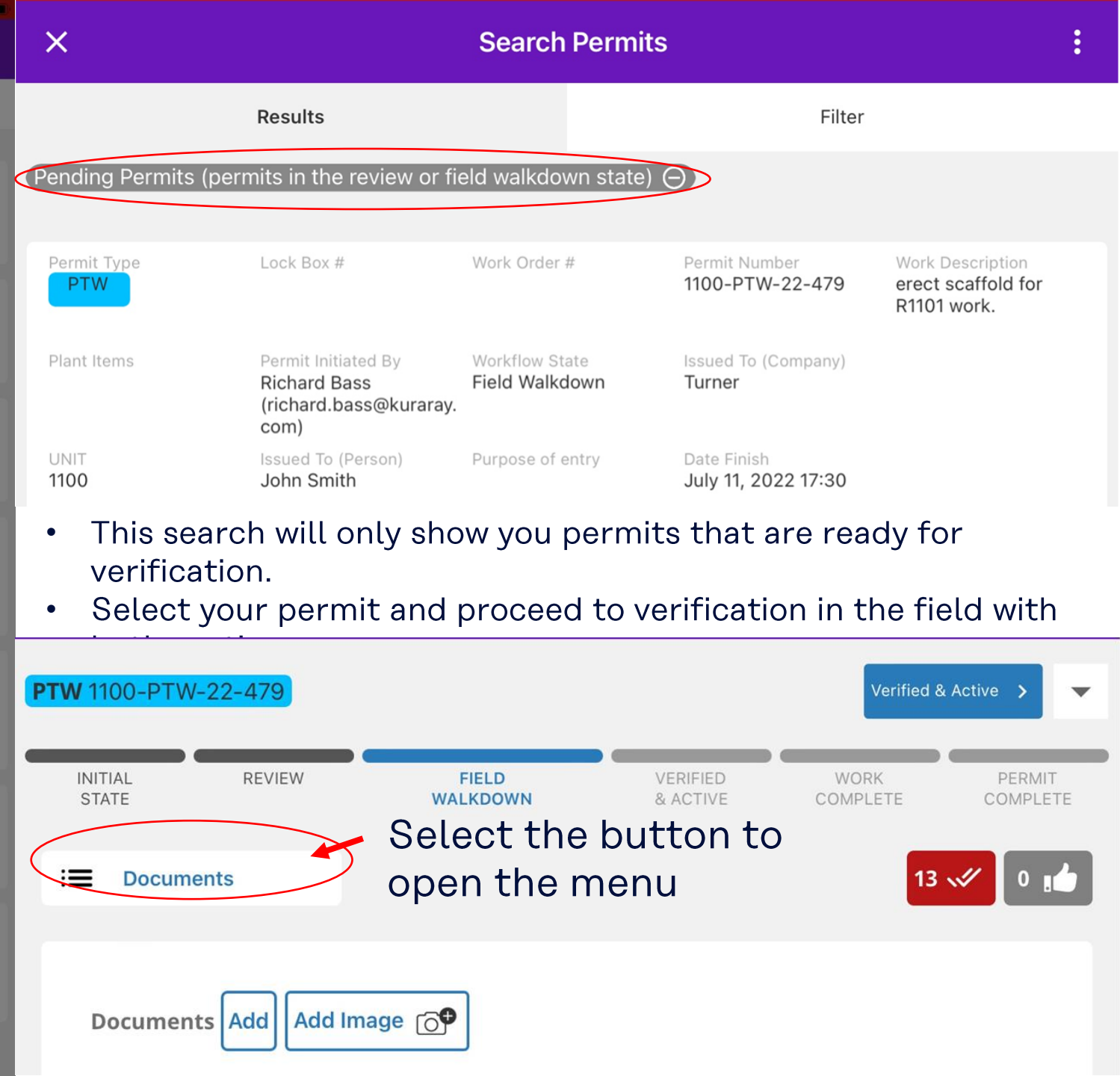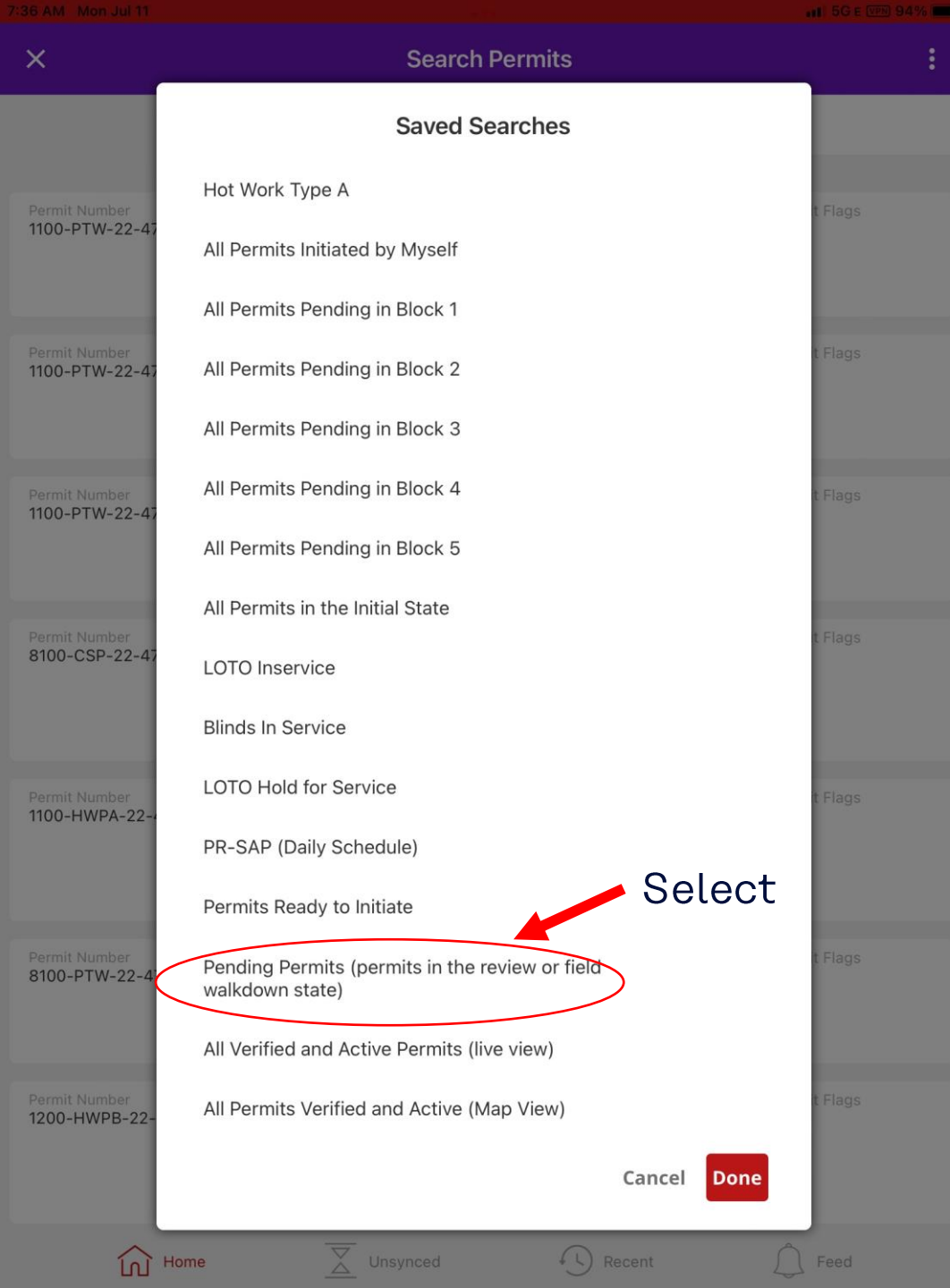
What are the specific STOP THE JOB triggers? *

HRP Reviewed

Owning Dept *

Owning Department Signature *

Affected Dept *

Affected Department Signature *

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Search Permits

Saved Searches

Hot Work Type A

All Permits Initiated by Myself

All Permits Pending in Block 1

All Permits Pending in Block 2

All Permits Pending in Block 3

All Permits Pending in Block 4

All Permits Pending in Block 5

All Permits in the Initial State

LOTO Inservice

Blinds In Service

LOTO Hold for Service

PR-SAP (Daily Schedule)

Permits Ready to Initiate

Select

Pending Permits (permits in the review or field walkdown state)

All Verified and Active Permits (live view)

All Permits Verified and Active (Map View)

Cancel **Done**

Permit Number
1100-PTW-22-47

Permit Number
1100-PTW-22-47

Permit Number
8100-CSP-22-47

Permit Number
1100-HWPA-22-4

Permit Number
8100-PTW-22-4

Permit Number
1200-HWPB-22-

Home   Unsynced   Recent   Feed

Search Permits

Results | Filter

Pending Permits (permits in the review or field walkdown state) ⊖

Permit Type	Lock Box #	Work Order #	Permit Number	Work Description
PTW			1100-PTW-22-479	erect scaffold for R1101 work.

Plant Items	Permit Initiated By	Workflow State	Issued To (Company)
	Richard Bass (richard.bass@kuraray.com)	Field Walkdown	Turner

UNIT	Issued To (Person)	Purpose of entry	Date Finish
1100	John Smith		July 11, 2022 17:30

- This search will only show you permits that are ready for verification.
- Select your permit and proceed to verification in the field with

PTW 1100-PTW-22-479   Verified & Active ▸ ▾

INITIAL STATE — REVIEW — **FIELD WALKDOWN** — VERIFIED & ACTIVE — WORK COMPLETE — PERMIT COMPLETE

☰ Documents

Select the button to open the menu

13 ✓✓   0 👍

Documents [Add] [Add Image 📷⊕]

Go to section

General Details

Plant Items

HIRA

Relationships

Documents

Review   Select Review   **13**

Work Party Sign-On

Save

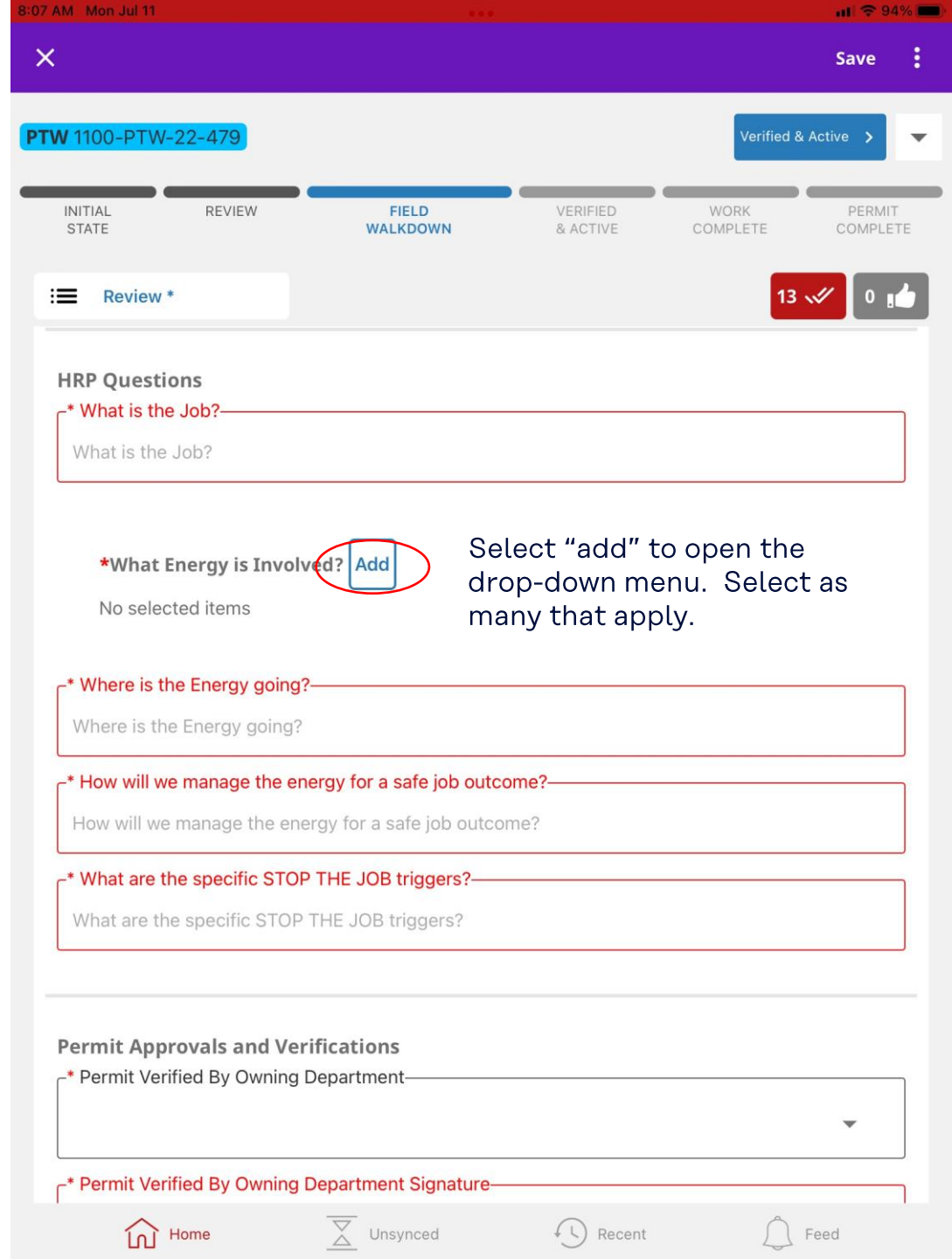**13** ✓✓   0 👍
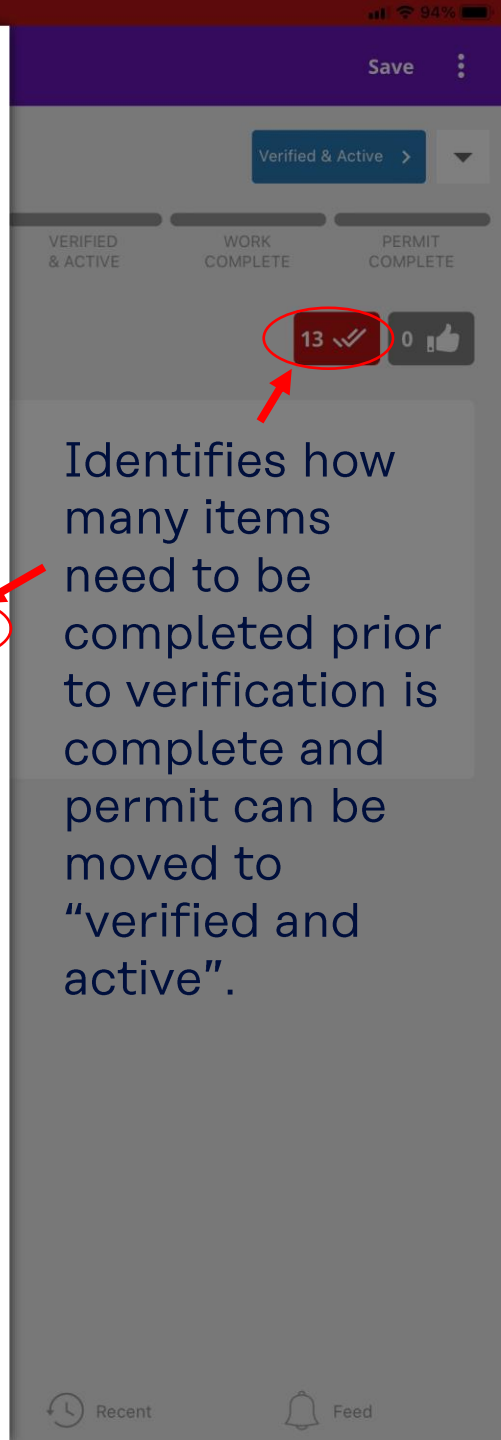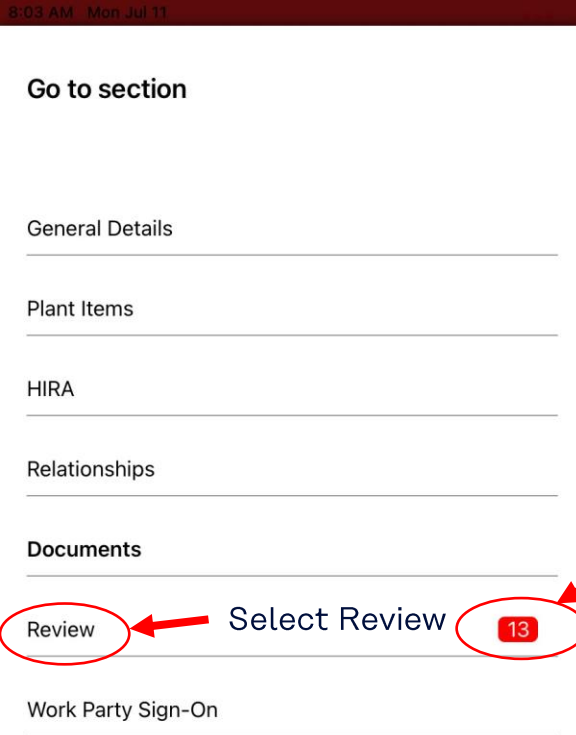
Identifies how many items need to be completed prior to verification is complete and permit can be moved to "verified and active".

Verified & Active ›

- The contractor is responsible for filling out the HRP Questions and discuss with the Owner prior to sign offs.
- Everything in red or with a red asterisk is a required field.

✕   Save   ⋮

PTW 1100-PTW-22-479   Verified & Active ›

INITIAL STATE | REVIEW | **FIELD WALKDOWN** | VERIFIED & ACTIVE | WORK COMPLETE | PERMIT COMPLETE

☰ Review *   **13** ✓✓   0 👍

HRP Questions

┌ * What is the Job? ─────────────────────┐
│ What is the Job?   │
└───┘

*What Energy is Involved? [Add]   Select "add" to open the drop-down menu. Select as many that apply.

No selected items

┌ * Where is the Energy going? ───────────┐
│ Where is the Energy going?   │
└───┘

┌ * How will we manage the energy for a safe job outcome? ┐
│ How will we manage the energy for a safe job outcome?   │
└───┘

┌ * What are the specific STOP THE JOB triggers? ┐
│ What are the specific STOP THE JOB triggers?   │
└───┘

Permit Approvals and Verifications

┌ * Permit Verified By Owning Department ──┐
│   ▾ │
└───┘

┌ * Permit Verified By Owning Department Signature ┐

HRP Example

HRP QUESTIONS	
Question	**Answer**
What is the Job?	Replace control valve on hcv1101
What Energy is Involved?	Motion, Heat and Cold, Electrical, Pressure, Chemical, Gravity
Where is the Energy going?	To control valve
How will we manage the energy for a safe job outcome?	360 awareness of your surroundings

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PTW Issued To (Company):
Turner

Permit #: 1100-PTW--22-24077

Permit To Work

What are the specific STOP THE JOB triggers?	Loto not executed properly

HRP REVIEWED		
Owning Dept	Rafael Trevino (rafael.trevino@kuraray.com)	
Affected Dept	Jesus Olivas (jesus.olivas@kuraray.com)	

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PTW 1100-PTW-22-479

Verified & Active >

INITIAL STATE | REVIEW | **FIELD WALKDOWN** | VERIFIED & ACTIVE | WORK COMPLETE | PERMIT COMPLETE

☰ Review *

13 ✓✓   0 👍

HRP Questions

Save ⋮

Task Pad

What Energy is Involved?
❗ What Energy is Involved? is required

What is the Job?
❗ What is the Job? is required

Select the Task Pad button to see what remaining tasks are required prior to moving to "Verified and Active".

Where is the Energy going?
❗ Where is the Energy going? is required

How will we manage the energy for a safe job outcome?
❗ How will we manage the energy for a safe job outcome? is required

What are the specific STOP THE JOB triggers?
❗ What are the specific STOP THE JOB triggers? is required

Owning Dept

Approvals

Field Walkdown Approval

Declaration

Reviewed permit face-to-face at Field Walkdown

┌─Reason─────────────────────────┐
│   │
│ Reason   │
│   │
└────────────────────────────────┘

Once you have completed all the tasks you will be prompted to give a final approval that the permit has been reviewed face-to-face during Field Walkdown.

Reject   **Approve**

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Owning Dept
❗ Owning Dept is required

Owning Department Signature
❗ Owning Department Signature is required

Affected Dept
❗ Affected Dept is required

Affected Department Signature
❗ Affected Department Signature is required

Permit Verified By Affected
❗ Permit Verified By Affected is required

Permit Verified By Affected Signature
❗ Permit Verified By Affected Signature is required

🏠 Home   ⧗ Unsynced   🕐 Recent   🔔 Feed
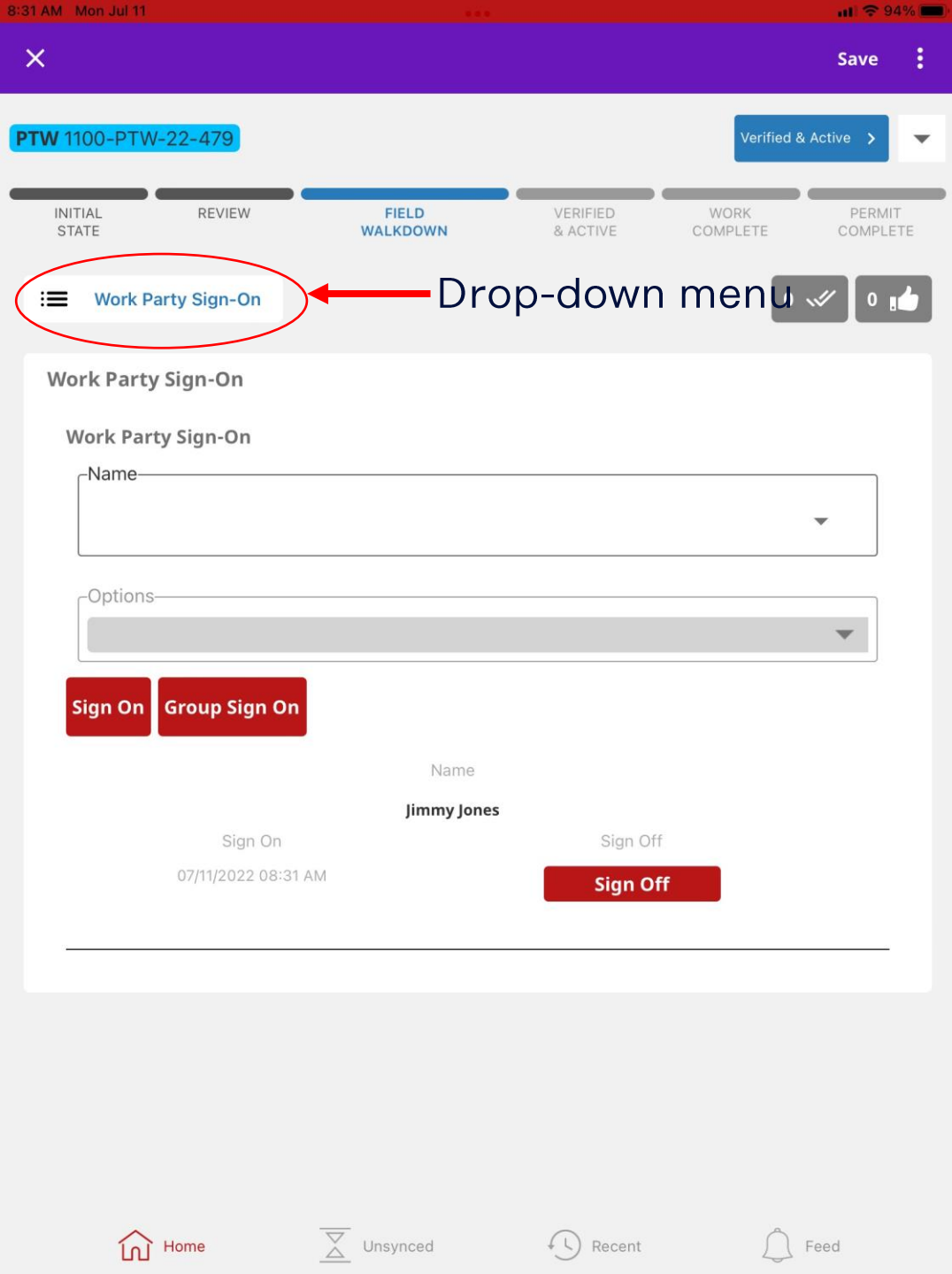
Work Party Sign On and Off

1. Select the drop-down menu and click on the "Work Party Sign-On" page.
2. Enter the name(s) of all people working on the permit and then select "Sign On".
3. If someone needs to leave the permit, select the red "sign off" button under neath their name.
4. If someone needs to be added to the permit, enter the name and select "Sign On".

Moving Permit to Verified and Active

- Once all verifications and work party sign-ons have occurred, select the Verified & Active button.
- Make sure that you are connected and the system updates.
- If the device says disconnected, move to an area where you are connected to make sure the system is updated.

Dashboard-Home Screen

Electronic Permitting provides a real time dashboard/home screen for all permits

Map View of All Active Permits

Color Coded by permit type
- Blue – PTW
- Orange – HWPB
- Red – HWPA
- Yellow – CSP

Allows Quick Overview
- Emergency Response
- Focused Audits

Permit Closeout

Additional Benefits of E Permits

- **Every action is time stamped**
  - Time on tools

- **Monthly reporting**
  - Total permits
  - Permits by Type
  - Permits by Area
  - Permits by Day
  - Permits by Company

- **Compliance**
  - Keeps all permits in one location
  - Allows for easy audits
  - Track completion
  - Incident Investigations

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ePAS LOTO

LOTO Process Flow

Create isolation plan → Approval → Approved LOTO Plan Database → Create LOTO from Approved Isolation Plans → Review → Isolate - Operations → Walkdown & Verify - Contractor with Operations → Modify / Active (In Service) → Modify / Maintenance Completion → De-Isolate → Return to Service → Hold for Service → Complete

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Blind Process Flow

```
Planning
   │
   ▼
Approval
   │
   ▼
Approved Blind Plan Database
   │
   ▼
Create BIC from Approved Isolation Plans  →  Isolate - contractor under direction of OPS
                                                      │
                                                      ▼
                                             Verification - Operations
                                                      │
                                                      ▼
                                             In Service  ⇄  Modify
                                                      │
                                                      ▼
                                             Maintenance Completion  →  De-Isolate all but overhead blind - Contractor
                                                                                      │
                                                                                      ▼
                                                                        Modify LOTO to remove lock from bleeder used for pressure testing
                                                                                      │
                                                                                      ▼
                                                                        Pressure Test
                                                                                      │
                                                                                      ▼
                                                                        Depressure  →  Ops closes bleeder
                                                                                              │
                                                                                              ▼
                                                                                      Maintenance affiixs lock on bleeder valve
                                                                                              │
                                                                                              ▼
                                                                                      Remove Overhead Blind
                                                                                              │
                                                                                              ▼
                                                                                      Maintenance removes lock on bleeder valve  →  Ops control of bleeder valve and N2 purge on vessel
                                                                                                                                            │
                                                                                                                                            ▼
                                                                                                                                   Ready for Service
                                                                                                                                            │
                                                                                                                                            ▼
                                                                                                                                      Complete
```
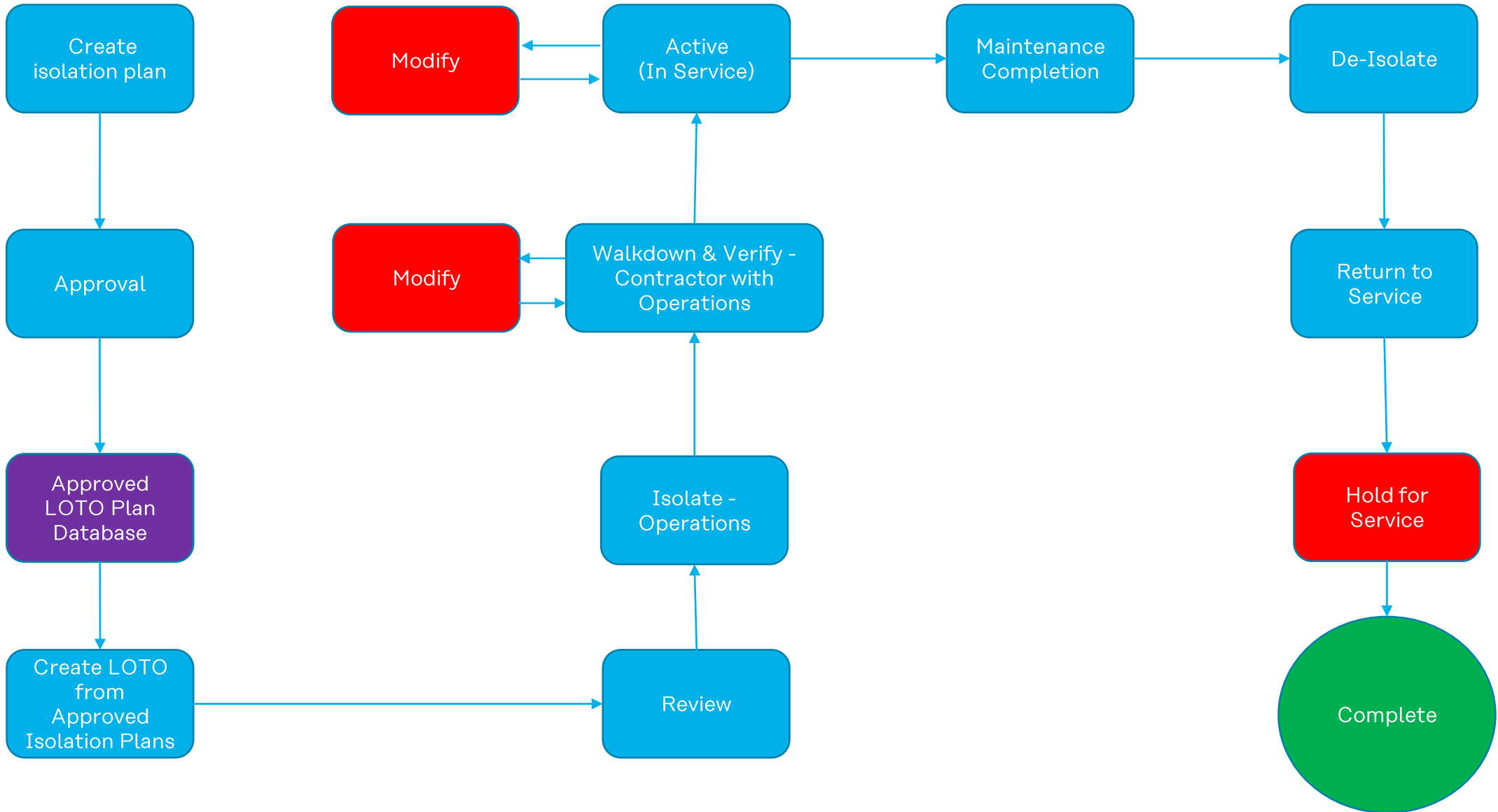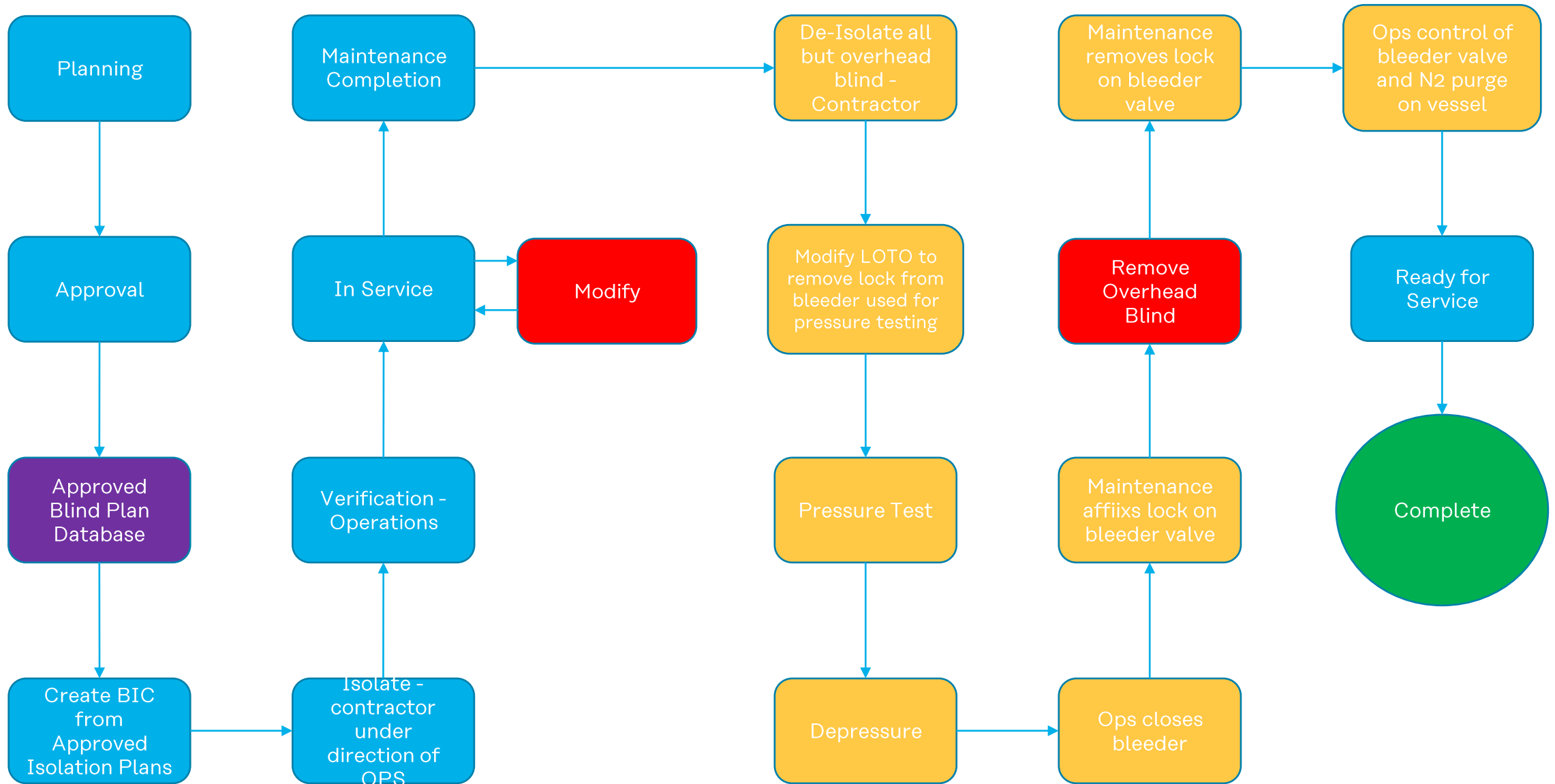
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Approved – Verified Isolation Plans

Create LOTO from Approved – Verified Isolation Plan

After "Review" proceed to "Isolate" by printing tags and isolating equipment.
1. Each isolation point will have a QR coded tag that will be used for verification
2. Once isolation and verification with QR code is complete it will turn that isolation point from orange to green

Left screen

✕   Save ⋮

LOTO 1100-LOTO-22-489

Walkdown and Verify › ▾

| ISOLATE | WALKDOWN AND VERIFY | ACTIVE | MAINTENANCE COMPLETE | DE-ISOLATE | RETURN TO SERVICE | HOLD FOR SERVICE | COI |

☰ **Isolations ***   1 ✓✓   0 👍

Lock Box #
22

Plant Items

☆ 10000810-V-1115 COAGULATOR FEED VESSEL

*Isolations +

⊞ Table

Tag number
[Tag number] [|||||]   [Isolate]

Tag number
[Tag number] [|||||]   [ ]

Isolation Point Descri	Equipment Isolated	Isolation Point Descri	Equipment
4" inlet from 02 filter	4" inlet from 02 filter	6" outlet to paste pumps	6" outlet to pumps
Normal Energy Source	Lock?	Normal Energy Source	Lock?
Chemical	None	Chemical	None
Blind?	Chemical Type	Blind?	Chemical T
None	None	None	None
Lock Open/Close	Normally Open/Close	Lock Open/Close	Normally C
Close	Open	Close	Open

🏠 Home   ⏳ Unsynced   🕑 Recent   🔔 Feed

Right screen

✕   Save ⋮

LOTO 1100-LOTO-22-489

Walkdown and Verify › ▾

| ISOLATE | WALKDOWN AND VERIFY | ACTIVE | MAINTENANCE COMPLETE | DE-ISOLATE | RETURN TO SERVICE | HOLD FOR SERVICE | COI |

☰ **Isolations ***   1 ✓✓   0 👍

Lock Box #
22

Plant Items

☆ 10000810-V-1115 COAGULATOR FEED VESSEL

*Isolations +

⊞ Table

Tag number
[Tag number] [|||||]   [Isolated]

Tag number
[Tag number] [|||||]   [ ]

Isolation Point Descri	Equipment Isolated	Isolation Point Descri	Equipment
4" inlet from 02 filter	4" inlet from 02 filter	6" outlet to paste pumps	6" outlet to pumps
Normal Energy Source	Lock?	Normal Energy Source	Lock?
Chemical	None	Chemical	None
Blind?	Chemical Type	Blind?	Chemical T
None	None	None	None
Lock Open/Close	Normally Open/Close	Lock Open/Close	Normally C
Close	Open	Close	Open

🏠 Home   ⏳ Unsynced   🕑 Recent   🔔 Feed

DANGER

1100-LOTO-22-488

Isolation Point Description:	1/2" nitrogen tie in to sight glass
Area:	EVAL
Unit:	1100
Plant Item:	10000810
Notes:	Nitrogen
Energy Source:	Chemical
Lockbox #:	77
Normal Pos:	Open
Isolated Pos:	Close
Tag #:	383757

7:33 AM Tue Aug 16   69%

✕   Save   ⋮

LOTO 1100-LOTO-22-488   In Service › ▾

LATE	WALKDOWN AND VERIFY	ACTIVE	MAINTENANCE COMPLETE	DE-ISOLATE	RETURN TO SERVICE	HOLD FOR SERVICE	COMPLETE

☰ **Isolations**   2 ✓✓   0 👍

☆ 10000810-V-1115 COAGULATOR FEED VESSEL

Isolations +

▦ Table

Tag number		Tag number	
Tag number ▥	Isolated	Tag number ▥	
Tag number ▥	Verified	Tag number ▥	

Isolation Point Descrip	**Equipment Isolated**	**Isolation Point Descrip**	**Equipment**
4" inlet from 02 filter	4" inlet from 02 filter	6" outlet to paste pumps	6" outlet to pumps
Normal Energy Source	**Lock?**	**Normal Energy Source**	**Lock?**
Chemical	None	Chemical	None
Blind?	**Chemical Type**	**Blind?**	**Chemical T**
None	None	None	None
Lock Open/Close	**Normally Open/Close**	**Lock Open/Close**	**Normally C**
Close	Open	Close	Open
Blind Type	**Overhead Blind**	**Blind Type**	**Overhead I**
None	None	None	None
Notes		**Notes**	
EVAC/MeOH		EVAC/MeOH	

🏠 Home   ⧗ Unsynced   🕓 Recent   🔔 Feed

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Isolations (4) *

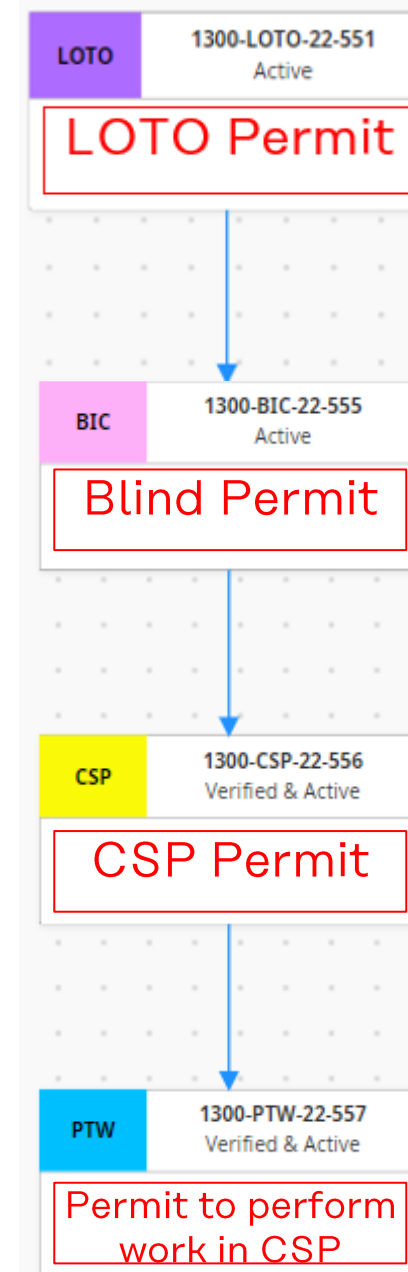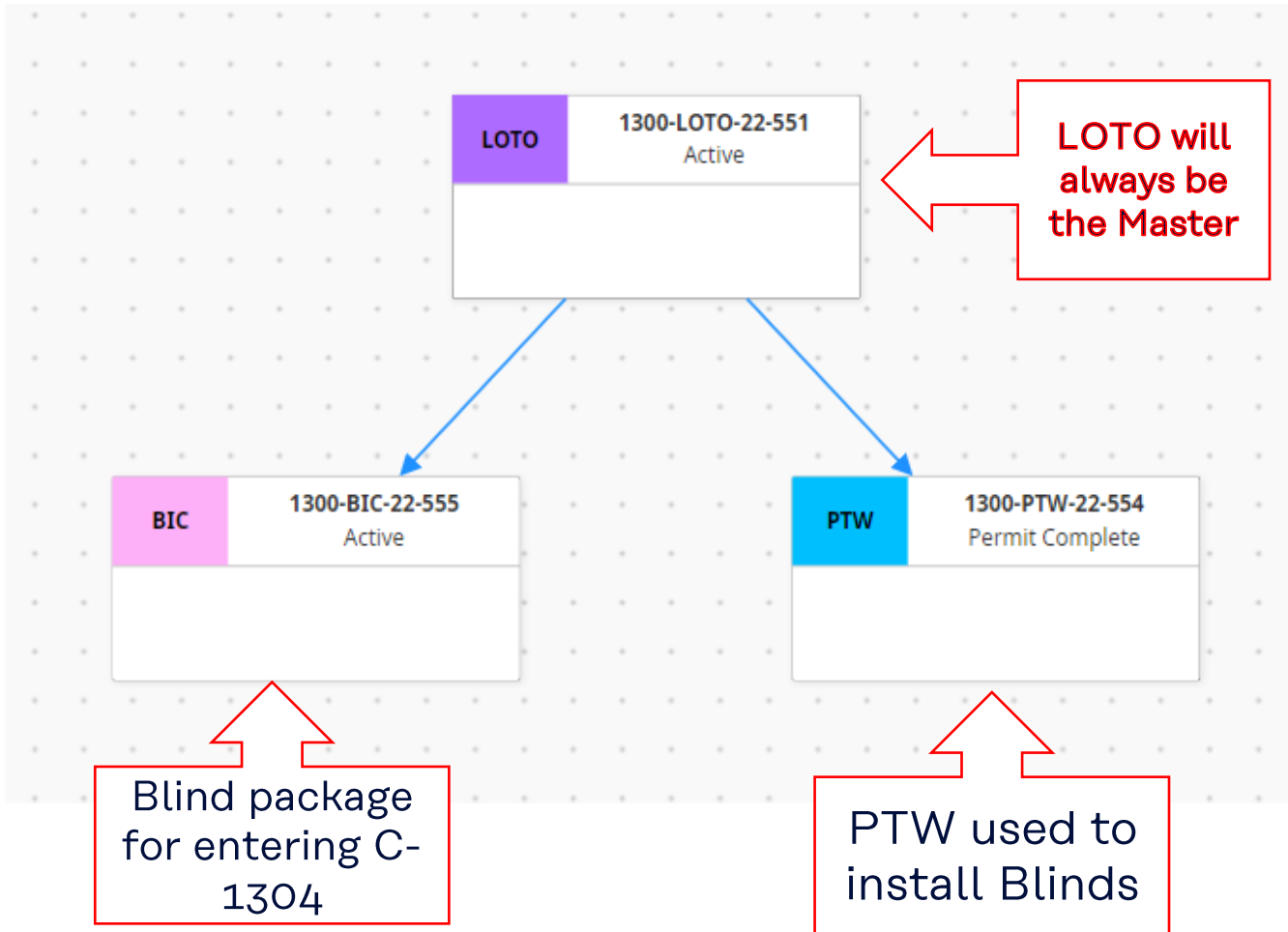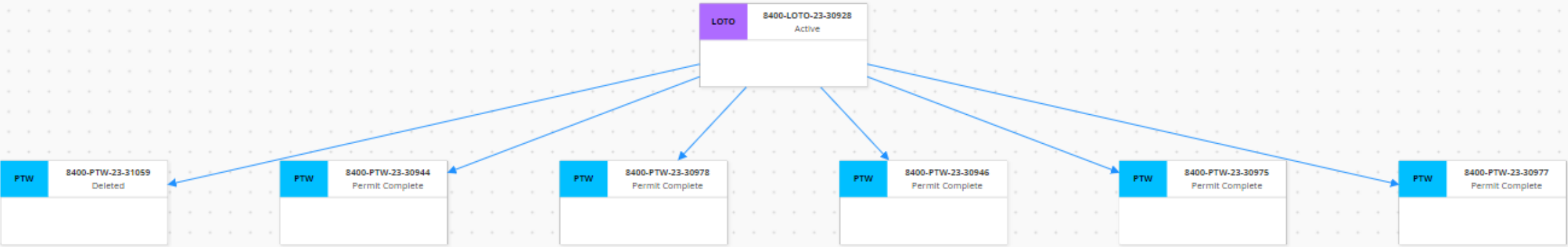|	Isolated	Plant Item	Details	Isolation Point Description	Equipment Isolated	Normal Energy Source	Is this Lock or Blind?	Test	Normal/Lock Position	Blind Information
⠿	*Isolated by Richard Bass* ✓	**Plant Item** *None* **Description** *None* **Exclusive** No **Isolation Type** *None*	**Isolated Condition** *None* **Restore to Condition** *None* **Method of Proving** *None*	**Isolation Point Description** 4" inlet from 02 filter	**Equipment Isolated** 4" inlet from 02 filter	**Normal Energy Source** Chemical	**Lock?** No **Blind?** No	**Chemical Type** *None*	**Lock Open/Close** Close **Normally Open/Close** Open	**Blind Type** *None* **Overhead Blind** *None*
⠿	[ ] ✓	**Plant Item** *None* **Description** *None* **Exclusive** No **Isolation Type** *None*	**Isolated Condition** *None* **Restore to Condition** *None* **Method of Proving** *None*	**Isolation Point Description** 6" outlet to paste pumps	**Equipment Isolated** 6" outlet to paste pumps	**Normal Energy Source** Chemical	**Lock?** No **Blind?** No	**Chemical Type** *None*	**Lock Open/Close** Close **Normally Open/Close** Open	**Blind Type** *None* **Overhead Blind** *None*
⠿	[ ] ✓	**Plant Item** *None* **Description** *None* **Exclusive** No **Isolation Type** *None*	**Isolated Condition** *None* **Restore to Condition** *None* **Method of Proving** *None*	**Isolation Point Description** 1.5" inlet from die plate wash adapters	**Equipment Isolated** 1.5" inlet from die plate wash adapters	**Normal Energy Source** Chemical	**Lock?** No **Blind?** No	**Chemical Type** *None*	**Lock Open/Close** Close **Normally Open/Close** Close	**Blind Type** *None* **Overhead Blind** *None*
⠿	[ ] ✓	**Plant Item** *None* **Description** *None* **Exclusive** No **Isolation Type** *None*	**Isolated Condition** *None* **Restore to Condition** *None* **Method of Proving** *None*	**Isolation Point Description** 1/2" nitrogen tie in to sight glass	**Equipment Isolated** 1/2" nitrogen tie in to sight glass	**Normal Energy Source** Chemical	**Lock?** No **Blind?** No	**Chemical Type** *None*	**Lock Open/Close** Close **Normally Open/Close** Open	**Blind Type** *None* **Overhead Blind** *None*

Add Point

Isolations (4)

	Isolated	Verified	Plant Item	Details	Isolation Point Description	Equipment Isolated	Normal Energy Source	Is this Lock or Blind?	Test	Normal/Lock Position
⠿	*Isolated by Richard Bass* ✓	*Verified by Richard Bass* ✓	**Plant Item** *None* **Description** *None* **Exclusive** No **Isolation Type** *None*	**Isolated Condition** *None* **Restore to Condition** *None* **Method of Proving** *None*	**Isolation Point Description** 4" inlet from 02 filter	**Equipment Isolated** 4" inlet from 02 filter	**Normal Energy Source** Chemical	**Lock?** No **Blind?** No	**Chemical Type** *None*	**Lock Open/Close** Close **Normally Open/Close** Open
⠿	*Isolated by Richard Bass* ✓	*Verified by Richard Bass* ✓	**Plant Item** *None* **Description** *None* **Exclusive** No **Isolation Type** *None*	**Isolated Condition** *None* **Restore to Condition** *None* **Method of Proving** *None*	**Isolation Point Description** 6" outlet to paste pumps	**Equipment Isolated** 6" outlet to paste pumps	**Normal Energy Source** Chemical	**Lock?** No **Blind?** No	**Chemical Type** *None*	**Lock Open/Close** Close **Normally Open/Close** Open
⠿	*Isolated by Richard Bass* ✓	*Verified by Richard Bass* ✓	**Plant Item** *None* **Description** *None* **Exclusive** No **Isolation Type** *None*	**Isolated Condition** *None* **Restore to Condition** *None* **Method of Proving** *None*	**Isolation Point Description** 1.5" inlet from die plate wash adapters	**Equipment Isolated** 1.5" inlet from die plate wash adapters	**Normal Energy Source** Chemical	**Lock?** No **Blind?** No	**Chemical Type** *None*	**Lock Open/Close** Close **Normally Open/Close** Close
⠿	*Isolated by Richard Bass* ✓	*Verified by Richard Bass* ✓	**Plant Item** *None* **Description** *None* **Exclusive** No **Isolation Type** *None*	**Isolated Condition** *None* **Restore to Condition** *None* **Method of Proving** *None*	**Isolation Point Description** 1/2" nitrogen tie in to sight glass	**Equipment Isolated** 1/2" nitrogen tie in to sight glass	**Normal Energy Source** Chemical	**Lock?** No **Blind?** No	**Chemical Type** *None*	**Lock Open/Close** Close **Normally Open/Close** Open

Hierarchy - Relationships

LOTO will always be the Master

Blind package for entering C-1304

PTW used to install Blinds

LOTO Permit

Blind Permit

CSP Permit

Permit to perform work in CSP

Example of LOTO Relationship to Permits

Lockboxes in Service Dashboard

Lockboxes in Service

Permit T...	Lock Box #	Title	Work Description	Workflow State	Permit Number	U
LOTO	K123	K-9002	Troubleshooting fans and replacing wires and motor inside oil storage building.	Walkdown and Verify	FAC-LOTO-23-675	
LOTO	212	Clean M-1382 Shaker Screen	Remove and clean M-1382 Shaker Screen	Isolate	1300-LOTO-23-674	
LOTO	323	C-1204 for Entry	Isolate C-1204 for entry	Active	1200-LOTO-23-672	
LOTO	Block 2 Saponification	Block 2 Saponification	Zone isolation for block 2 Saponification. This will be for all chemicals coming into and going out of this area.	Active	1100-LOTO-23-670	
LOTO	25	P-8501	Change pump seal	Isolate	8500-LOTO-23-656	
LOTO	A	C-1304	C-1304 isolate for entry	Active	1300-LOTO-23-650	
LOTO	224	K-9001 Chemical Additive Storage Bld	Troubleshoot fans and replace wires and motor.	Isolate	FAC-LOTO-23-655	
LOTO	196	K-9002	Troubleshooting fans and replacing wires and motor inside oil storage building.	Isolate	FAC-LOTO-23-654	

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Lessons Learned/What's Next

- **Development of core team**
  - Most important part of the process
  - Need input/buy in from all stakeholders
- **On prem server vs hosted server**
  - On prem is dependent on company IT to manage
  - Hosted server is monitored 24/7
- **Apple licensing issues**
  - Apple only issued 100 licenses for iPads
- **Connectivity issues**
  - 5G works great but still connection issues in different locations within process units

- **Microsoft Surface Pro App development**
  - Decided to switch from iPads to Surface Pros
  - IT has better control of Microsoft products
- **Switch to hosted server**
- **SAP Integration**
- **Wi-Fi project**
  - Site implementing a Wi-Fi system to support ePAS and condition monitoring of critical equipment.

kuraray

Thank you!

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