



Programmatic health & safety audits at remediation sites using Lean principles

Jennifer Kingston, Ph.D., P.E.

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Agenda

- 1 Desired outcomes – the why
- 2 What we did – the what
- 3 Procedures and Lean tools – the how
- 4 Lessons learned
- 5 Questions

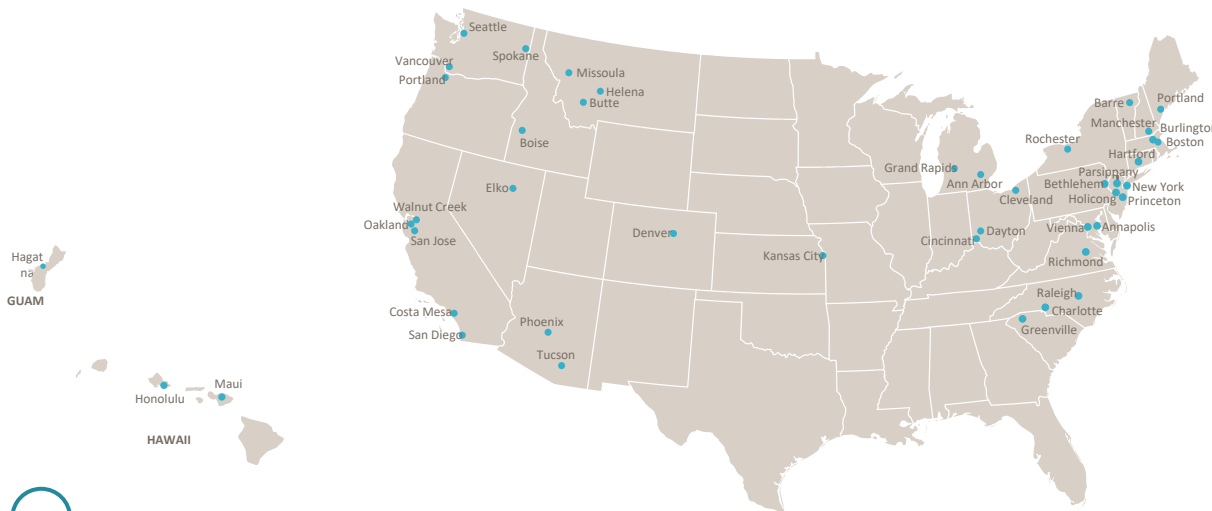
Who is Haley & Aldrich

We are environmental & engineering consultants
serving four major markets:

- Energy
- Industrial & manufacturing
- Government & infrastructure
- Real estate & development

Our services include:

- Brownfields
- Construction
- Contaminated site management
- EHS compliance
- Geotechnical engineering
- Lean consulting
- Sustainability & resilience



Our safety culture

- We do not sacrifice safety for profit, sales, schedule, growth, or convenience.
- Each of us must plan for safety.



- We positively acknowledge safe behaviors in the moment and upon review.
- Safe behaviors are integrated into staff performance assessments.

- Don't ask if an event will happen, plan for when it happens.
- Errors will happen. Plan to mitigate potential injury or fatality.

- Blame fixes nothing.
- We broadcast learnings from deviations and use them to improve.

- We are all responsible for the safety and wellbeing of ourselves and others.
- We identify and address unsafe conditions and behaviors.

Our client's cardinal rules

Cardinal Rules

Confined spaces: Employees and contractors must follow written procedures for entry into confined spaces.



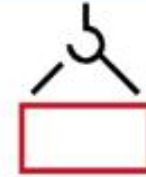
Control of hazardous energy: Employees and contractors must follow machine/equipment specific energy control procedures to bring all forms of hazardous energy to a "Zero Energy State" and secure them prior to performing work on machines or equipment.



Fall protection: Employees and contractors must use fall protection when exposed to a fall hazard (working at an elevated level of 2 meters / 6 feet or more).



Hoist and crane: Employees and contractors must use appropriately rated devices and safe lifting techniques for all rigging, hoist, and crane lifted loads.



Machine guarding: Employees and contractors must use and not tamper with or disable machine / equipment guarding while operating under normal conditions.



Electrical safety: Employees and contractors must be qualified and follow documented electrical safe work practices when working with or when exposed to energized electrical circuits 50 volts or more AC/DC.



Powered industrial vehicles: Employees and contractors must not operate a powered industrial vehicle unless trained and must not use personal electronic devices while operating any powered industrial vehicle.



Not following a cardinal rule can lead to death or a serious injury.

Our Lean culture and program

- We pioneered Lean into our services starting in early 2000s.
- Lean in everything we do: we **develop our people to improve project performance and client satisfaction**, and by **making work easier and more rewarding to staff**.

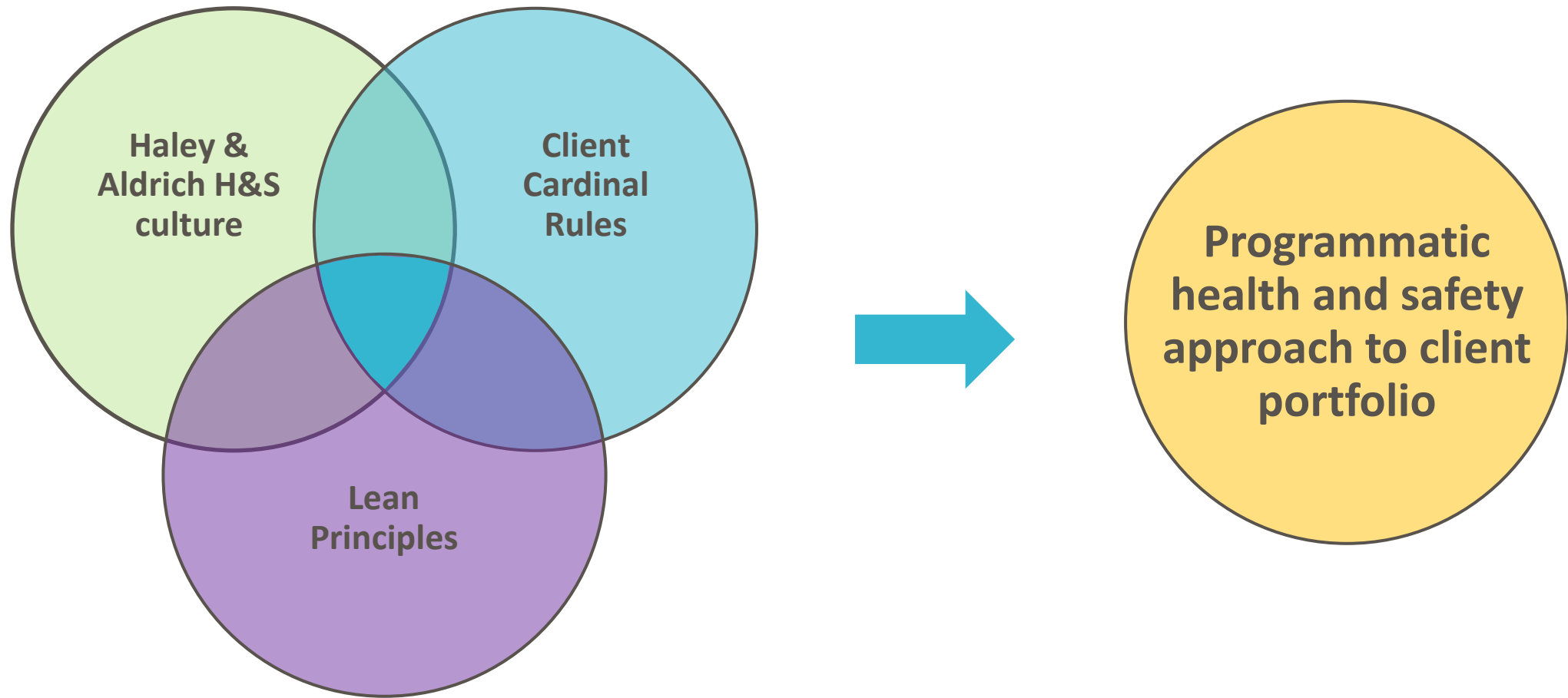
Increases **Value**
Reduces **Waste**
Respects **People**

Learning and applying Lean is
a great way to contribute to
our strategic focus areas.

Our way of learning and applying Lean

- Act your way into a new way of thinking
- Worry less about Lean tools, focus on Lean principles
- You will not become an expert overnight: humility is our friend.

Application

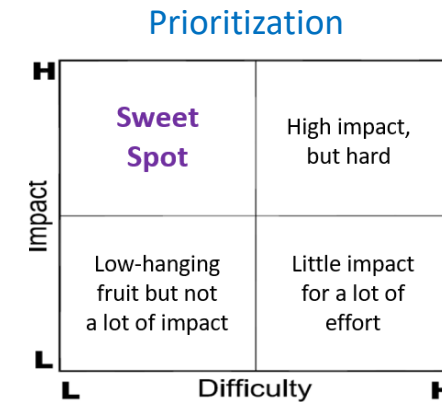
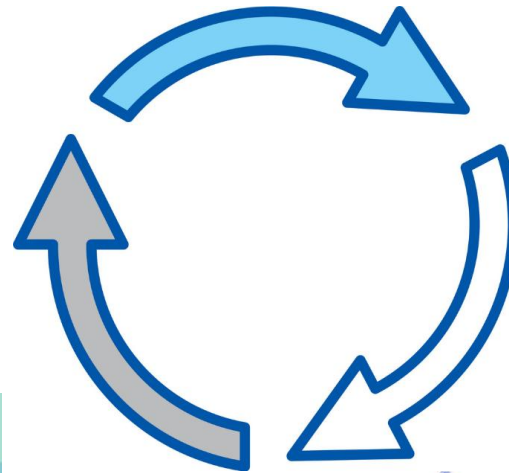
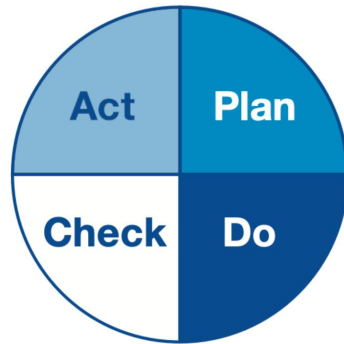


Site characteristics

- Soil, groundwater, and soil vapor remediation sites
- Active systems:
 - soil vapor extraction
 - groundwater extraction
 - sub-slab depressurization systems
 - treatment systems (potential exposure to chemicals, heat, electricity, and occupational hazards)
 - sampling/monitoring
 - traffic control
 - hazardous substances and hazardous waste



How we did it



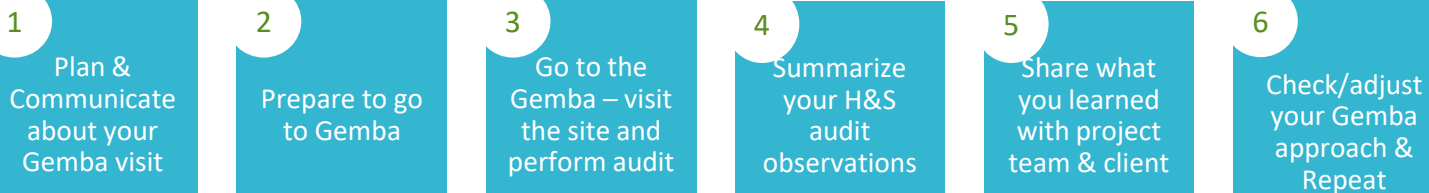
Improvement
Newspaper

Lean tools used – Gemba



Gemba refers to “the place where value is created.”

- The Gemba = the place where the work is done.
- Going to Gemba is an opportunity to understand how the work is done, what’s going well, and what problems get in the way, from the perspective of the person doing the work!
- It’s a chance to ask staff what bothers them and what would help.
- It’s a way to learn together and find ways to improve.
- Who was involved in Gemba? Field personnel including sub-contractors, Haley & Aldrich H&S representative and project management team, client representatives.

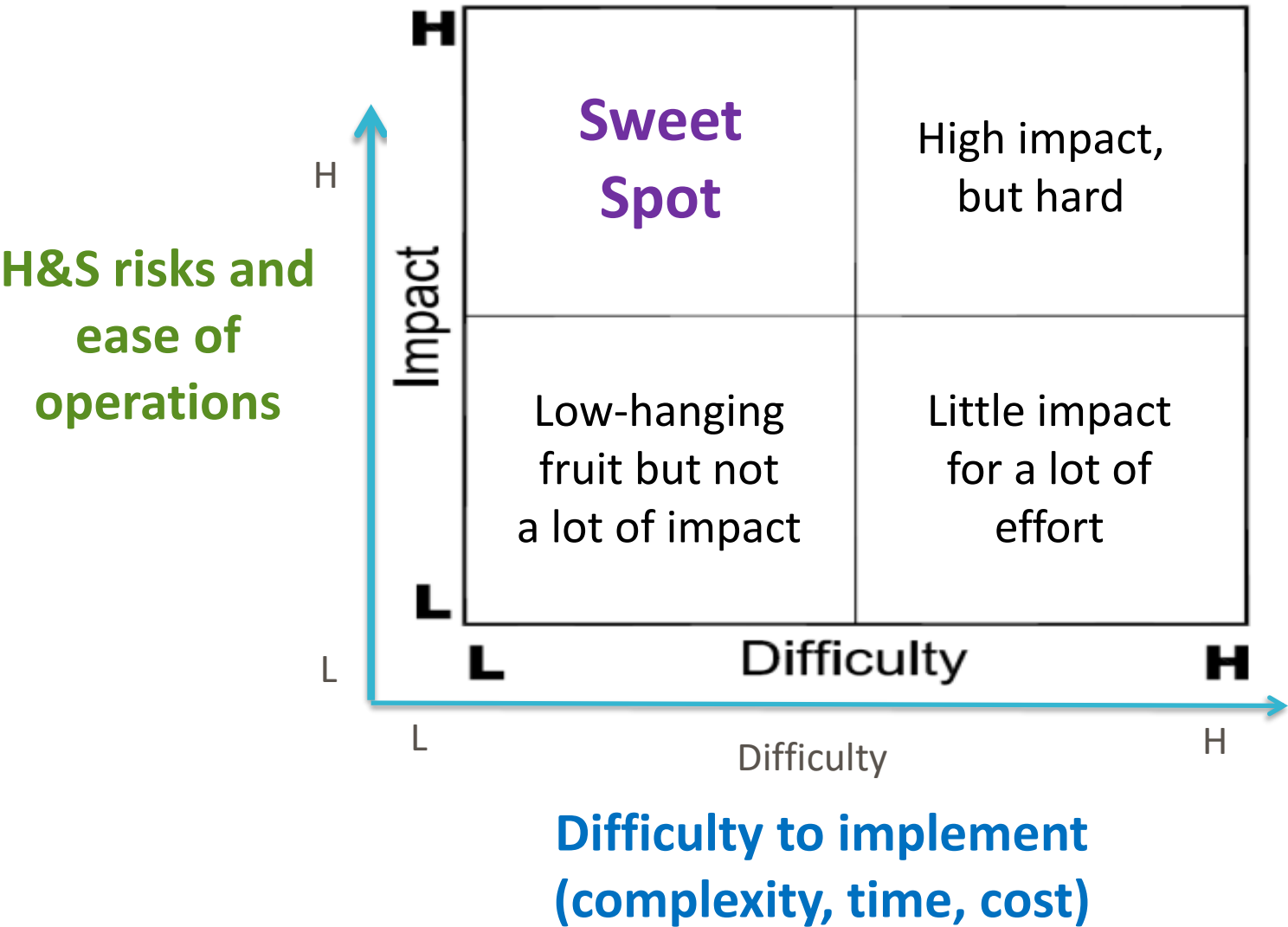


Lean tools used – Gemba vs. audit

Both are valuable in H&S improvements. However:

- In our Gemba, we involved field personnel, project portfolio managers, client representatives, and H&S officers – all with equal voice. In a typical site inspection, participation is typically limited to H&S officer and sometimes field personnel.
- In Gemba, there is an immediate visibility to the many stakeholders to what is working (also very important to continue the success) and where there is a need for improvement. In an audit, the reporting is limited to corrective actions and information is a trickle-down process from H&S officer to the rest of the team.
- In our Gemba, we had observations beyond OSHA requirements, such as what would streamline operations and make it easier on field personnel. An audit is focused on OSHA and H&S requirements.

Lean tools used – prioritization



1

List of H&S proposed actions from Gemba

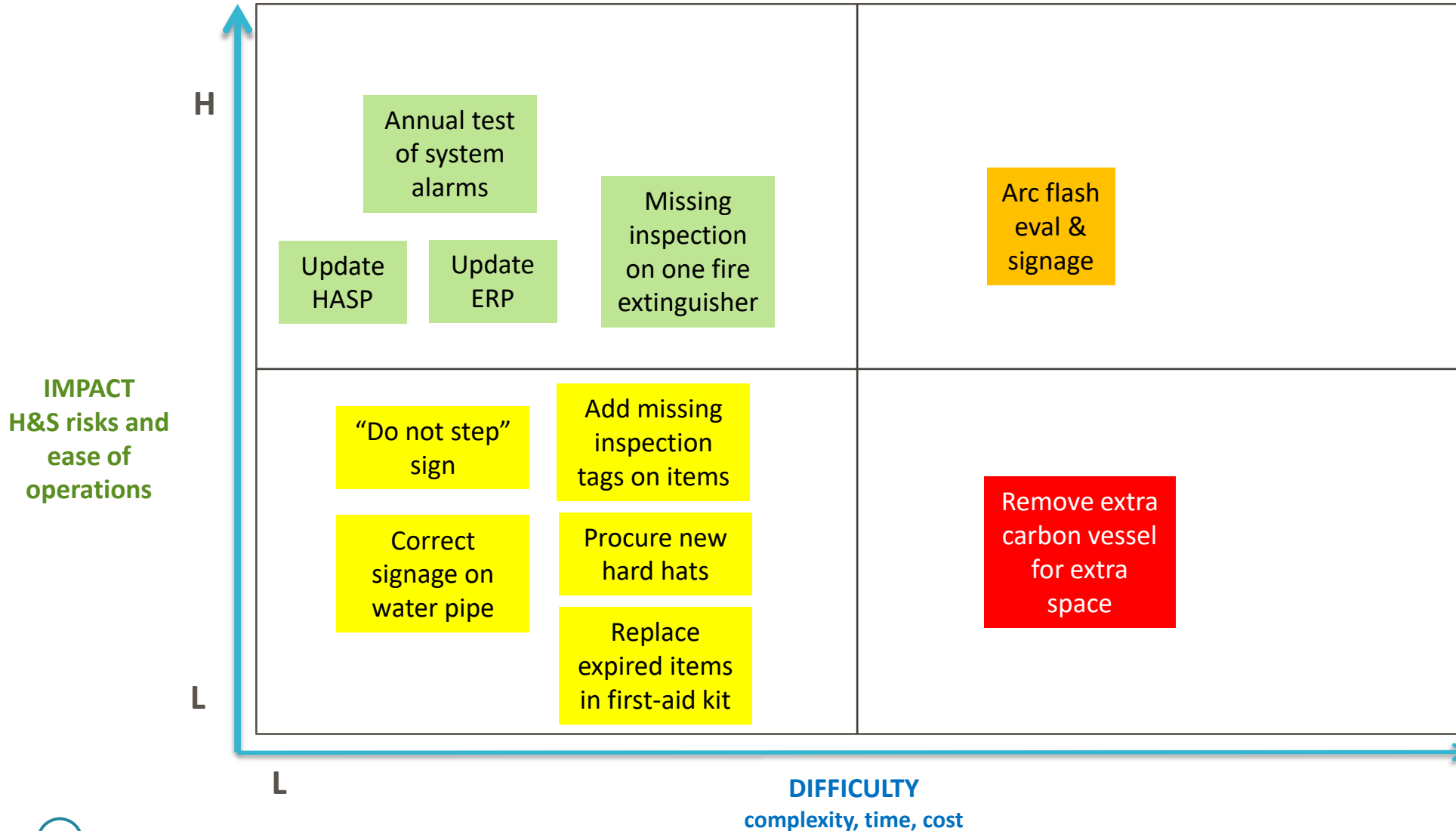
2

Determine impact and difficulty criteria for prioritization

3

Team prioritizes proposed actions

Lean tools used – prioritization example

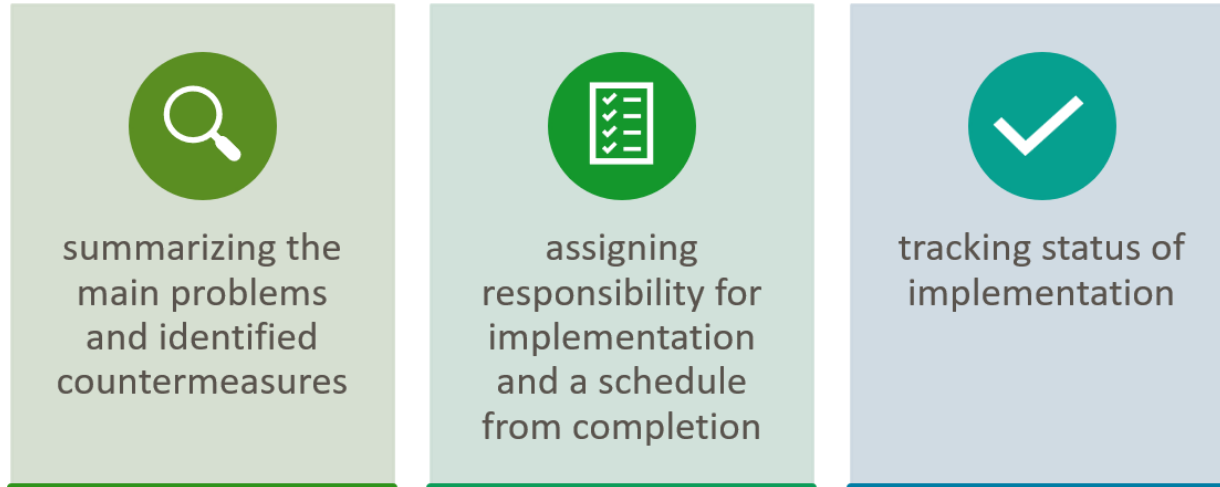


Notes:

- HASP – Health and safety plan
- ERP = Emergency response plan
- This is not a comprehensive list – select actions from one of the sites are shown for demonstration
- Prioritization is completed for each site

Lean tools used – improvement newspaper + RACI

A Lean tool for.....



TIPS

The **A**ccountable person is who makes sure the work gets done.
The **R**esponsible person is the one who actual *does* the work.
Where possible, make action items SMART: Specific, Measurable, Attainable, Realistic, Timely.

Note: For this application, we used only the R and A of the RACI but not the C (consulted) and I (informed) to track action items.

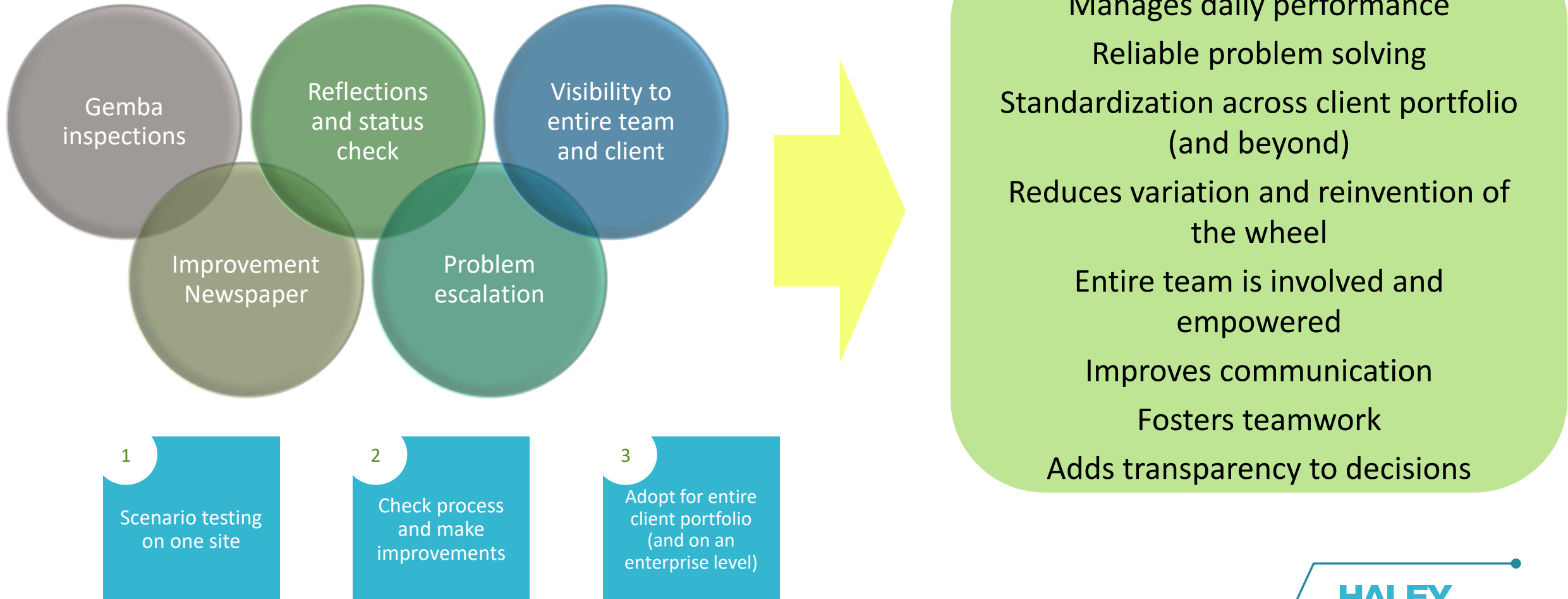


Lean tools used – improvement newspaper + RACI: Example

Status Check-in date: 4/20/2024

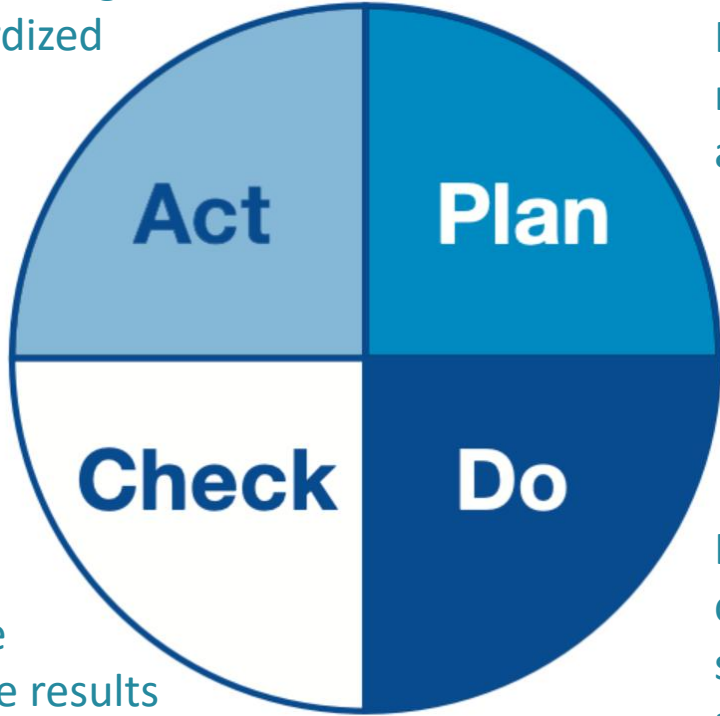
#	Observation	Improvement	A/R	Due date	Status
1	The protective outer layer of supply pipe to boiler is dented – looks like someone stepped on it.	Put “Do not step” sign on pipe.	JK/JS	4/15/2024	Complete
2	Sign on water supply pipe to eye-wash station say non-potable water, which is not correct.	Correct signage on water pipe to eye wash station.	JK/JS	4/15/2024	Complete
3	Field notes show that ladders and three fire extinguishers have been inspected by tag are not update.	Add missing inspection tags on fire ladders and fire extinguishers.	JK/JS	4/15/2024	Complete
4	Some hard hats at the facility have expired.	Procure new hard hats.	JS/DR	5/20/2024	In progress
5	Inspection of first aid kit show that certain items have expired.	Replace all expired items in first-aid kit as well as those that will expire in six months – or order new kit.	JS/DR	6/10/2024	In progress
6	HASP was last updated in 2023.	Update HASP.	JS/DR	4/15/2024	Complete
7	ERP was last updated in 2022.	Update ERP.	JS/DR	4/15/2024	No new requirements. Updated dates.
8	Automated alarms on treatment system have not been tested since 2022.	Perform annual test of system alarms	JS/MN Inc.	6/30/2024	In progress
9	Certain electrical components are missing arc flash signage.	Contract electrical comp to inspect for arc flash and provide signage if needed.	JK/Elec Inc.	4/15/2024	Eval complete, but delay in obtaining signage

Lean tools used – standardized work



Lean tools used – plan-do-check-adjust

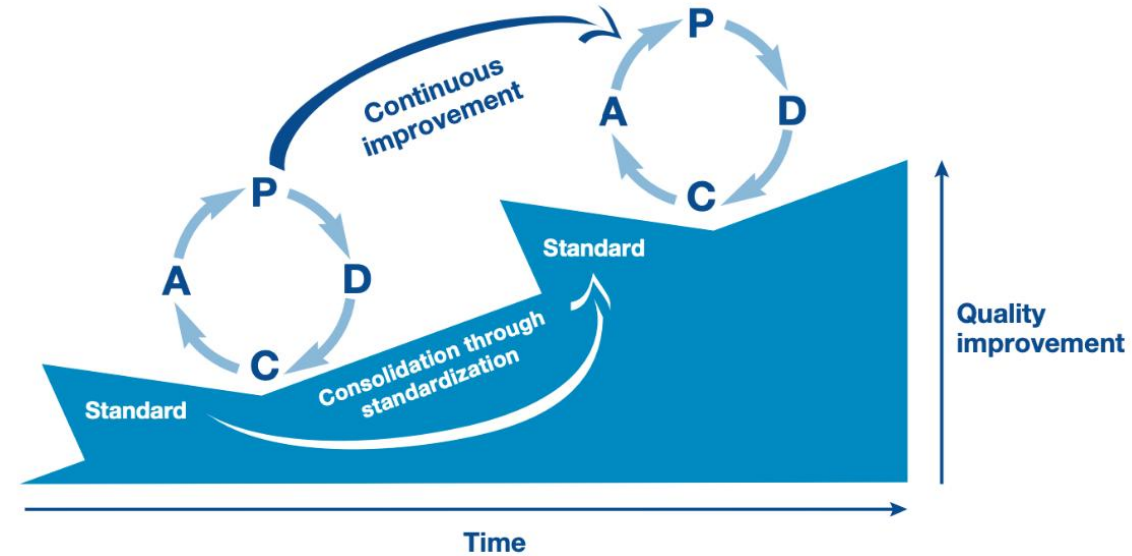
Implement changes to the standardized process



Evaluate the performance results

Determine goals for H&S process and needed changes to achieve them.

Implement the changes to the standardized H&S audit process



PDCA is a continuous improvement process – relies on facts, observations, honesty, and commitment to improvements. It is applicable to all aspect of work.

We used PDCA to check on standardized H&S inspection work through lessons learned and make improvements to the H&S inspection process.

Lessons learned

- Involvement of entire team – including the client – cemented trust, engagement, and visibility.
- There is always room for improvement: problems are gold! – an observation/improvement at one site could be applicable at others.
- Standardization simplified the process, enabled repetition on other sites, and reduced transactional costs.
- Lean is simple, uses common sense, and streamlines processes – everyone's voice is important.
- The most important element of the work is our health and our safety – everything else is secondary.

Acknowledgements

This work could not have been completed successfully without the participation of my colleagues:



Kendra Coblenz
Project manager



Elie H. Haddad, PE
Client portfolio manager and
Lean facilitator



Kelly Hoggan, PG
Project manager



Patrick Keddington
Project manager



Jonathan Speak
H&S officer and field
activities manager

And many others...

Thank you VPPPA for inviting us.

Questions