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## HOW TO JUSTIFY RELIABILITY IMPROVEMENT INITIATIVES

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# HOW TO JUSTIFY RELIABILITY IMPROVEMENT INITIATIVES

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## INTRODUCTION

At the last (2017) API Inspection Summit, there was a presentation on Integrity Operating Windows (IOWs). At the end, one of the audience members asked, “How do you justify this to your manager?” The response from the presenter? “That’s a great question.”

In our industry, we deal with more initiatives than our plates can handle. Corrosion Control Documents (CCDs), Alarm Rationalization, Corrosion Under Insulation (CUI) Programs, Risk-Based Inspection (RBI), Reliability Centered Maintenance (RCM), IOWs—the list goes on. How do we know which initiatives to implement, and further, which to do first? Even if you know which initiatives your facility should focus on, how do you convince leadership that something is worth investing in—especially if the initiative integrates across functions?

For example, what if you knew that using IOWs at your facility could create a return on investment that would show savings of \$10MM per year for an investment of \$1MM? Would anyone believe you? After all, these kinds of justifications are standard for most capital projects, and it only gets more complicated when trying to justify an integrated work practice. This article will cover an approach to cost-justification of initiatives—that integrate across functions and departments—to your facility’s management through three steps:

1. Identifying and scoping improvement opportunities,
2. Measuring opportunities, and
3. Planning initiatives and gaining buy in.

The key to this approach is evaluating your site practices and performance—the result of which will highlight the most valuable improvement opportunities.

## STEP 1. IDENTIFY AND SCOPE IMPROVEMENT OPPORTUNITIES

It’s typically not hard to find opportunities to improve upon. However, aligning stakeholders on the approach to improve can be challenging. Therefore, it is important to agree on a common language and scope for assessing site practices and site performance. For example, most work practices integrate across different departments of a facility. These work practices may include creating and using key performance indicators (KPIs), data and systems, proactive asset strategies, maintenance, operations, and asset health monitoring. To maximize effectiveness and measure the impact of work practices, you should ensure that everyone (i.e., groups, people, departments, etc.) involved in any area of the work practice are aligned in defining the boundaries and integration touch points.

In addition to scoping the work practices, you also need to agree on what will be measured to assess facility performance. An IOW initiative is a good example because it crosses the functions of engineering, operations, inspection, and maintenance. It also affects maintenance costs, capital costs, safety performance, and downtime.

Using IOWs as an example, let’s consider two scenarios (Scenario 1—a typical unoptimized approach, and Scenario 2—an optimized approach):

### Scenario 1:

**Plan:** Failures that can be prevented by IOWs are identified by looking at leaks that could be related to process deviations outside of an optimal range. What’s wrong with this? It is too vague, narrow and it has judgement in how it defines ‘optimal range’ when one hasn’t been identified yet. Furthermore, is the perspective of operations taken into account?

### Scenario 2:

**Plan:** Overall performance is scoped by trackable and measurable areas for business improvement (e.g., planned downtime, unplanned downtime, and maintenance capital for fixed equipment). Practice areas are also scoped, which can include: Mechanical Integrity (MI) strategies, asset health monitoring, process controls, anomaly response, planning and scheduling, and turnaround management.

These are not presumptuous or contentious; they use language that could be found in plant goals and reference functions that align with the organizational chart.

What if you wanted to set an even broader scope to ensure the greatest value? You could get lucky and find that work practices and facility performance are already defined in an asset management framework with KPIs. However, if these do not exist, another starting point could be found in a comprehensive assessment performed by the facility. These assessments, typically, have a regimented approach and can be highly valuable in ensuring you’re identifying the right gaps in a comprehensive way.

In summary, you should use accepted terminology and frameworks within the facility to answer the questions: How does the business know that there is a problem? What work practices are involved with the problem and any potential solutions?

## STEP 2. MEASURE OPPORTUNITIES

To measure your opportunity, you will need to know where you want to be versus where you are today. Measure the performance first to determine the potential return on any investment.

An important question to consider is: Do you want to be better than you were last year, or do you want to be the best you can reasonably be? With the first option, you can use continuous improvement practices, looking for waste and defects. With the latter option, you should benchmark your site's performance and practices against top performing peers. To ensure a complete perspective, be sure to include input from the different stakeholder groups, as well as their performance numbers.

Using the scope as a guide, you need to understand where actual performance is impacted to measure current state and serve as the baseline for your improvement initiatives. This data will help you demonstrate the potential value to be realized by improvement initiatives.

To estimate potential value, you need to do the following:

1. **Benchmark Site Performance Results:** Measure your site's performance results against top performing peers.
2. **Benchmark Site Practices:** Understand what your site is doing today. What are industry best practices? What are your gaps?
3. **Connect the Opportunities:** Matrix out the performance gaps against the practices gaps. The greatest opportunities to improve performance results should set your priority in closing gaps in practices.

Back to the IOW example:

### Scenario 1:

You found 30 leaks last year and only three had enough documentation to know that some changes in process conditions shortened the expected life of equipment. You suspect that many other leaks could also be contributing to similar changes, but you don't have enough information to make that claim. However, you do know that there is a zero-leak goal and these three failures were noteworthy at the site and that there is value in preventing them. In this scenario, you have measured against your scope, but since your scope is limited, you have not measured an impact on the site's overall performance.

### Scenario 2:

You have measured your current state and benchmarked your fixed equipment program against top performing peers. The results of this benchmark are displayed in **Figure 1**.

After you completed the benchmarking, you discovered your performance in relation to your top performing peers. By calculating the difference between the two values, you discovered your opportunity. For example, everything being equal, if you know maintenance capital for your top peers is \$10MM/year, but yours is \$15MM/year, you can calculate the \$5MM/year opportunity:

$$\text{\$15MM} - \text{\$10MM} = \text{\$5MM}$$

Your practices were also assessed against those of top performers with the following results (on a scale of 1-5, 5 being the best):

- Mechanical Integrity (MI) strategies (3)

	Current State	Top Performing Peers	Opportunity
Planned Downtime	5%	2%	3% = \$25MM
Unplanned Downtime (fixed equipment)	2%	.5%	1.5% = \$12.5MM
Maintenance Capital (fixed equipment)	\$15MM/year	\$10MM/year	\$5MM/year

**Figure 1.** Benchmark Data

- Asset health monitoring (5)
- Process controls in support of MI (2)
- Anomaly response (2)
- Planning and scheduling (4)
- Turnaround management (4)

More importantly, detailed practices show that internal inspections typically find a significant amount of discovery work and have extended turnarounds (five days on average); damage mechanisms reviews and corrosion studies are not used in the time-based inspection program; there is no use of IOWs; and the capital portfolio is overwhelmed with vessels recommended for replacement. This tells you where practices and performance are weak, but the solutions and justifications don't jump out yet. The practice area benchmarking scores are used to identify where to look further. It is the specific gaps in practices that set up your list of potential solutions.

Once you've completed the benchmarking, connect the opportunities. Matrix out the performance gaps against the specific list of solutions. This is the step that is most often skipped. The greatest opportunities to improve performance should set your priority in closing gaps in practices. This is usually performed more holistically, but an example specific to the IOW example is shown in **Figure 2**.

### STEP 3. PLAN INITIATIVES AND GAIN BUY-IN

How was it determined that some solutions would have an impact in some areas but not others? If a table like **Figure 2** is going to be used, be sure that it is a summary of more in-depth analysis. In other words, show your work. This is like a math problem — don't just show the final answer. Make sure that you document how you arrived at your scope, how you measure performance and — especially — how you connected impacts to value. It should be logical and as simple as possible for others to understand.

Now create a plan. Recognize that becoming a top performer is a journey and rarely achieved by a point solution. It will take a well-thought-out approach and the creation of better habits and characteristics that drive reliability and efficiency. The plan to



	Planned Downtime	Unplanned Downtime	Maintenance Capital
Predict repairs for internal inspections	✓		✓
Perform Corrosion Modeling as part of a RBI program	✓	✓	
Implement IOW program		✓	✓
Perform life cycle analysis and FFS			✓
<b>Opportunity</b>	<b>\$25MM</b>	<b>\$12.5MM</b>	<b>\$5MM</b>

**Figure 2.** Matrix of Performance Gaps and Solutions

implement the solutions identified in the previous (measure) step should be ingrained into the work practices and supported by all who interact with the content. There may be foundational items that need to be set up such as having quick, quality information available to make decisions. Or in the above example, recognize that a complete RBI program should:

- Include a corrosion model integrated into practices for predicting damage and repairs,
- Integrate with an IOW program, and
- Integrate into a program that manages inspection findings, their assessment, their correction, and updating analyses based on triggers that come throughout the work practices.

The plan that you put together probably sounds like more than you had in mind and harder to justify, right? Why not just convert all your data into an RBI software, populate the IOWs and be done?

### Scenario 1:

Scenario 1 may have a plan to implement IOWs. However, it wouldn't have the desired return because 1) it will most likely not have good inputs into the program, and 2) it does not affect the things that change results. Namely, it does not facilitate changes in operating or maintenance practices and without integration into a proactive, risk-based inspection program, it can't really be sustained.

### Scenario 2:

Scenario 2 on the other hand, has led you to much more than you expected—an expanded scope that you feel more confident in. Even if the price tag is now \$6MM, it has been shown that these practices have saved your peers over \$40MM per year.

Much has been done already to gain buy-in, and now it is time

to present your case. Whether you set off to justify a small, point solution or new holistic approach to reliability or integrity, your plan can have a number of formats and should include:

- The sequencing of implementation. It should also include ingraining any changes through training, support, and software implementations, procedures, etc.
- The costs and resources needed, both internal and external, so that their availability can be accounted for
- The coordination with other initiatives and facility activities
- The timing of the payback so that the cashflow and budgets can be accounted for
- How you are going to measure and ensure the return on investment

To justify your plan, think: how might your approach be discredited? Include answers to these issues in your case. Ensure the logic is intuitive. Be sure to get feedback and validation from people outside your group. We all have different perspectives and it needs to be logical to others. Another benefit is that this results in broader ownership. Also, address any skepticism by clearly documenting your approach and by including stakeholders throughout the process to gain buy-in.

A statement like the one in Scenario 2 isn't as clear as you had hoped. Instead of being able to say, for example, that IOWs will save \$10MM per year for an investment of \$1MM, you have bundled the highest value solutions together to state your savings. Which is better? With the latter, you have gained understanding for the specific impacts of how IOWs specifically add value and you also understand that they are just part of an integrated solution. This final answer is much more likely to achieve the improvements that you are claiming.

## CONCLUSION

When you are not satisfied with current performance and are struggling to identify and justify the specific improvements to make, you will need to create a value-based plan for improvement. The first step is to become self-aware of your current and desired future state. The best way to achieve this is to perform a site assessment that will identify key gaps within an identified scope with quantified returns on your improvement opportunities. You will then be equipped to prove the value of improvement initiatives and later achieve that value. ■

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John Campo is a licensed mechanical engineer with over 20 years of experience in the oil, gas, chemical, and mining industries. As a PinnacleART Principal Engineer, John's notable accomplishments include developing a quantitative approach to benchmarking and RAM simulation; serving as SME for asset integrity, risk management, equipment design, maintenance, general reliability, and asset management. John has managed maintenance and reliability programs as an owner/user and has implemented corporate-wide programs including, Root Cause Analysis (RCA), shutdown assessments, Risk Based Inspection (RBI), SAP plant maintenance, and Reliability Centered Maintenance (RCM).



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