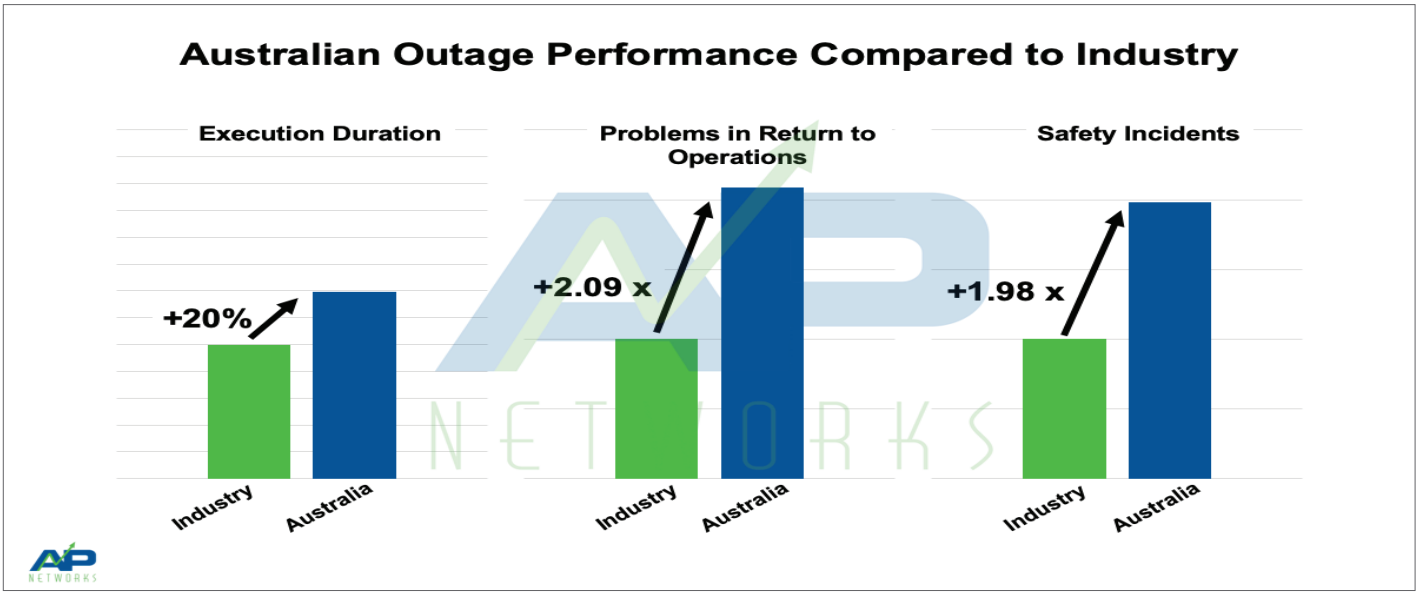
Australian manufacturers need to improve execution of maintenance outages and turnarounds



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MANY capital-intensive Australian companies are losing money as a result of poor execution of key maintenance activities. Like a small leak that is not properly closed, the drain on the balance sheet is slow but devastating.

Compared to the rest of the world, Australian manufacturers take nearly 20% longer to perform maintenance outages and turnarounds. Efforts to return to regular operations after an outage or turnaround are about twice as likely to encounter problems. And crucially, workers are much more likely to be hurt in executing these outages than they are during similar maintenance events executed in North America and Europe.

Australian industries have been making significant investments in new plants and equipment over the last two years, ameliorating a half decade of under investment that followed the last commodity super- cycle.

New plant and equipment investment grew more than 20% in 2018 and by nearly the same amount in 2019. Unfortunately, if current maintenance trends hold, some of the positive impact of this investment on future returns will be lost.

These conclusions derive from an analysis performed by Asset Performance Networks (AP-Networks), the results of which are summarised in Figure 1.

Australian Manufacturers Have Significant Gaps to Close

We came to these conclusions after analysing the results of twenty recent Australian maintenance outages and turnarounds from a variety of chemical, mining, oil, and power companies.

The analysis was conducted using the AP-Networks Turnaround Database, which incorporates data from more than 85 major companies and over 300 sites throughout Asia, Africa, Australia, Europe, the Middle East, North America, and South America. Using this global dataset, we compared the Australian event results to similar outages in North America and Europe. Similarity was determined by size and complexity, as measured by the scope and number of pieces of equipment to be worked on.

When looking at relative execution times—the duration from when the feedstock was taken out of the facility to when the feedstock was returned—we saw significant differences between Australia and others in Industry.

By normalising for scope and complexity, we can confidently state that this difference cannot be attributed to Australian outages being more complicated or larger in scope. We also reviewed the number of unplanned plant trips after start-up and saw that Australian outages were about twice as likely to encounter problems when returning to operations.

Additionally, we examined safety records, comparing the number of recordable incidents in Australia to North America and Europe, with the data showing that Australian outages are twice as likely to have safety incidents.

When Australian outage results are compared not just to the Industry average but instead to the top performers in Industry, the balance sheet drain grows even larger. Figure 2 compares top performers— the top quartile of Industry (or top 25%)—to the average Australian outage performance.

The data show that the best in Industry are 36% faster at executing outages of similar scope than Australian event teams and do so with fewer operations problems and much better safety results.

Why is Australian event performance lagging?

The AP-Networks Turnaround Database contains data on safety, cost, schedule, and early operational performance. It also includes information on how teams plan and manage turnarounds outages.

By looking at this data, we were able to identify the planning and management practices utilised by top performers—practices that are not being leveraged by many Australian event teams. To close the gaps, here are the key activities Australian manufacturers need to focus on:

- Late Start of Planning Australian event teams are often late to begin planning for an outage, resulting in the outage's scope being frozen late in the planning cycle. On average, Australian event teams freeze scope five months before the outage. The event teams that have the best results freeze scope nine months before the outage.

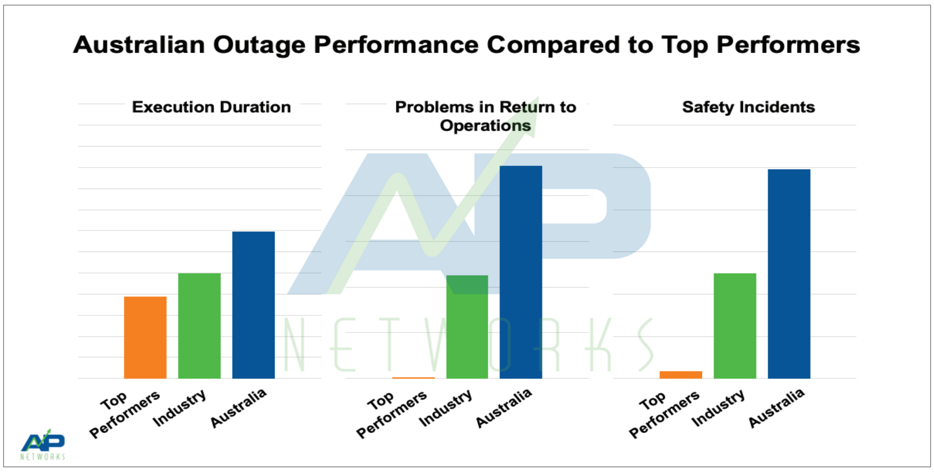
- Inability to Implement the Work Process Most Australian manufacturers have defined work processes for planning a maintenance outage, but the late scope freeze essentially subverts the value of the work process. The result is few Australian event teams can implement their work process.

• Inadequate Pre-Turnaround Planning Key areas of pre-turnaround planning lag in Australian turnarounds and outages. Inspection work is often under-resourced, leading to a holdup in getting information to planners. Safety planning sometimes lacks detail and rigor, and schedules are not optimized to determine the fastest execution path.

• Pre-Turnaround Work Slippage Pre-turnaround work slips into the execution window 80 percent of the time in Australian outages. Such slippage happens 45 percent of the time outside of Australia. The slippage of work into the execution phase leads to planning complications, lost productivity, and increased safety risk.

• Lack of Risk-Based Scope Review Australian teams rarely perform a risk-based scope challenge and review. Such a review conducted before the scope is frozen typically results in reducing the complexity of the outage. Often, elements of scope are found that can be executed before the outage begins, thereby reducing the complexity of the outage.

• High Volume of Discovery Work Australian teams discover more work during the outage than top performers. We measure discovery work as the percentage of work added during the turnaround, relative to total direct and material costs. Australian events log an average discovery of 10 percent added scope, while top performers add an average of four percent.



The high level of discovery work adds complexity to outage execution. Top performing organizations start the planning process for an outage earlier, which allows for the gathering and analysis of inspection and maintenance information; this information can then be readily incorporated into execution plans.

This reduces discovery surprises during the outage. Australian event teams have almost three times more discovery work than the top performers.

• Making the Journey to Excellence While the challenges outlined above may seem daunting, Australian manufacturers are up to the task. When Australian event teams take the time to properly plan for execution, conduct risk-based scope reviews, manage scope, and develop discovery contingency plans, the results have been strong safety, cost, and schedule performance, comparable to top performers.

It is time for Australian management to reexamine how they plan for maintenance turnarounds and outages in order to stop the balance sheet drain and implement best planning and execution practices.