

Australian Mining **safetowork**

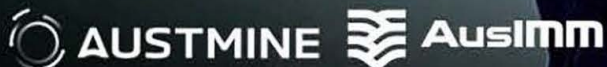
THE FIRST PRIORITY FOR AUSTRALIA'S MINING INDUSTRY

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All **EYES** on **SAFETY**

*Safety technology
in modern mining*

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Safe shutdowns

PREPPING FOR CONVEYOR MAINTENANCE AND IMPROVEMENTS WITH MARTIN ENGINEERING.

Scheduled plant shutdowns help to ensure optimum productivity, but they are also necessary from a maintenance and safety standpoint.

There are a few unwritten truths about shutdowns that anyone familiar with the process will understand: there is never a “convenient” time; it is impossible to be totally prepared; and completing a shutdown with zero injuries equals success, regardless of how much was accomplished.

Shutdowns are busy times, with in-house and contractor personnel working on tight timetables to complete an array of projects before the scheduled restart date. Budgets, times and production quotas all complicate plant shutdowns.

Despite the best planning, pushing to stay under budget and ahead of time can put sub-optimal equipment back into service, resulting in early failure. The rush to get back into production can also quickly cascade into a workplace hazard that causes “turnaround injuries” or incidents

that result from working too quickly under stringent – sometimes unrealistic – timelines.

THE ELEMENTS OF A PLANT SHUTDOWN

Planning for a shutdown should start directly following the previous one, as it can take months to complete all of the required steps.

Scheduled shutdowns have five general, often complicated, steps:

1. Scope
2. Plan
3. Schedule
4. Execute
5. Evaluate

It is important to identify the main areas of concern and prioritise the list by adding task labels to checklist items according to need: test; repair; replace; defer; do nothing.

CHOOSING SERVICERS AND CONTRACTORS

For safety and efficiency purposes, it is wise to choose trusted providers who are familiar with the site and

involve them early in the process to gather bids, discuss details and obtain their expert input.

The terms “servicer” and “contractor” are sometimes used interchangeably, since servicers are contracted, but their roles can be very specific: servicers are technicians who perform specialised scheduled tasks like belt cleaner replacement or other conveyor maintenance; contractors are often generalists supplying outside labour or specialists used for major equipment installation and construction, such as crane operators or structural engineers.

However, it is important to note that during a shutdown these may be the same person or company.

In most cases, factory-trained technicians will have greater experience and expertise than in-house personnel or third-party workers.

The goal should always be a project completed safely within the allotted time and budget, but that’s often not the case. An unexpected obstacle that requires a pivot in the plan, a logistical issue with receiving the proper equipment or a serious workplace injury can derail a timeline, resulting in extended downtime and increased costs.

There are several benefits to using the right specialised servicers during a shutdown:

- Training and expertise – they can quickly get the job done, identify potential issues and troubleshoot if necessary
- Faster access to the supplier – they often have maintenance and installation documentation on hand, and quick access to support from the supplier
- Safety and certification – certifications are required for some specified tasks for safety purposes;

Images: Martin Engineering



Shutdowns often require in-house personnel and contractors working on tight schedules.



Custom solutions should be coordinated by the contractor, and engineered and delivered before shutdown.

using an uncertified individual can increase the risk of injury and could be a liability issue

- Equipment considerations – specialised contractors generally have the proper tools on hand to overcome obstacles
- Engineering solutions – when unforeseen problems arise mid-project, experienced contractors can devise a safe workaround either on-site or by communicating with the equipment manufacturer's engineering staff
- Logistical considerations – servicers often work for or have a parts agreement with the equipment manufacturer, allowing quick access to replacement parts
- Insurance – specialty contractors typically carry specialised liability and workers' compensation insurance, which provides better protection for the customer than general insurance coverage

GATHERING BIDS

Detailed proposals are a key reason contractors and servicers are so valuable. It is helpful to identify outside resources who can help complete items on the checklist and then solicit plans and bids, ie a request for quote (RFQ). These bids, delivered as a proposal or statement of work (SOW), will offer a detailed account for materials, purchased components, contract services and in-house labour.

Quotes for materials should consider lead time not only for delivery, but also for the secondary operations such as preparatory engineering, electrical installation or component fabrication. When the RFQ is issued, ensure all necessary specifications for purchased components are provided.

PLANNING A SHUTDOWN

This is where the budget comes in.

Once the scope, specifications and timeline have been established, operators find that a large portion of planning has already been accomplished; however, sign-off is needed on the bids, which can take

time. Be aware that each SOW may have a purchase order (PO) and, once that's signed, the plant has committed to the provisions on the SOW.

A PO generally contains a payment schedule with an upfront payment before the shutdown begins to complete material orders, confirm commitments to sub-contractors to secure their schedule, etc.

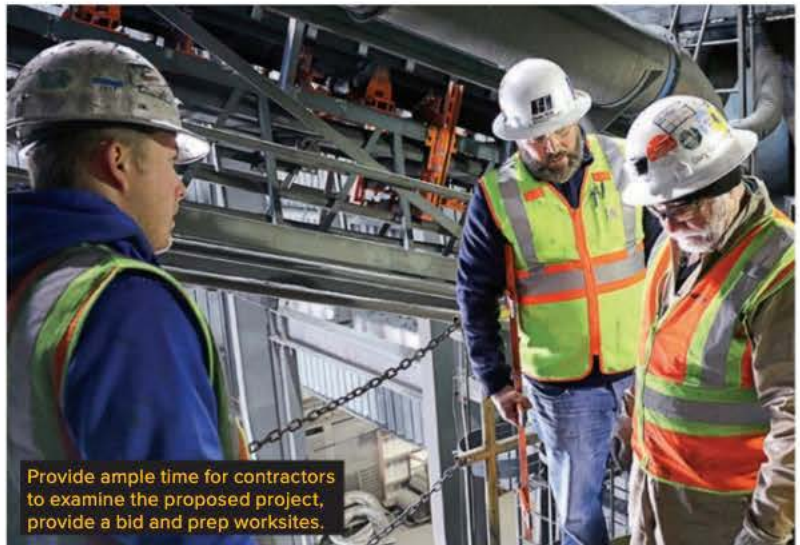
When planning, be aware of weather, holidays, pending labour contracts and compliance (permitting) issues during the closure period. Each of these can bring a project to a grinding halt.

This is also the phase during which key performance indicators (KPIs) are set for each project. These are metrics that indicate the performance and measures of success of each project involved in the shutdown.

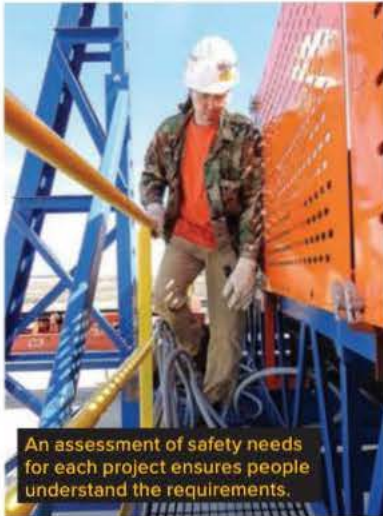
SCHEDULING A SHUTDOWN

When designs for components and sub-assemblies are finalised, the handover between design and manufacturing must take place.

The project manager should review the schedule, scope and specifications with all of those involved in the supply of the project components and sub-assemblies. When a project is underway is not the time to experiment with new vendors.



Provide ample time for contractors to examine the proposed project, provide a bid and prep worksites.



An assessment of safety needs for each project ensures people understand the requirements.



Communicating the timeline and scope improves safety and success.

Materials, components and sub-assemblies need to be inventoried and inspected as they are delivered. To avoid project delays, vendors need to be informed immediately of any shortages or non-conforming items, as well as the intended resolution determined.

Material shrinkage – via damage or pilferage – is a concern on many sites and can affect cost and schedule.

The scheduling process is a good time to ensure all of the required safety protocols and equipment are clearly understood by everyone involved in the shutdown.

Ensure proper certifications are up to date and any specialised equipment is available, lockout or tagout procedures are explicit and followed religiously, and all contractors are certified with the appropriate health and safety authorities.

Underestimating project timelines can rush the work and drastically erode safety, as can several different projects overlapping in the same area.

The project manager is responsible for controlling all work produced within the project scope.

They must watch for and carefully control any changes in scope,

commonly called “scope creep”. Changes for any reason must be documented by a change order.

EVALUATION OF A SHUTDOWN

This phase of the project will utilise the pre-defined KPIs to measure the success of the solution.

Evaluation regarding the performance of the system should be ongoing to ensure that it meets or exceeds expectations measured against the initial requirements in the scope and specifications phase of the project.

An important part of the evaluation phase is also measuring the return on investment for each project. This will often inform budgets into the future and could serve to raise budgets in forthcoming shutdowns to deliver greater improvements.

By thoroughly following these steps, maintenance managers will have a good starting point from which to deliver a successful shutdown. Skipping steps, on the other hand, may result in more unanticipated complications that could extend downtime and reduce overall efficiency.

Allowing the time for projects to be completed in a safe, systematic and compliant manner helps result in fewer injuries and better performance of installed equipment over the long term. **E**



KPIs can be logged with modern data-collection and monitoring technology.