

THE IMPORTANCE OF DECOMMISSIONING IN ASSET INTENSIVE INDUSTRIES

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Report Highlights

P3

Thirty-four percent of asset intensive companies feel increasing risk exposure as their top pressure, making optimization of scarce resources critical to the business.

P6

Asset intensive Leaders are 88% more likely than their peers to put processes in place to attack the decommissioning phase now.

P11

Asset intensive Leaders emphasize the importance of real time visibility to improve decision making. This allows Leaders to strive for operational excellence in their decommissioning projects

P13

Continuous improvement is being embraced by Leaders as the engine to transform the business; this plays a direct role in the 18% increase in project profitability that Leaders have seen in the last year.

Based on the experiences of over 600 respondents, this report will explore proper asset lifecycle management. Specifically the decommissioning phase of an asset's lifecycle - how it needs to be treated like its own major capital project and planned for now while the necessary resources are present.

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Asset intensive project-based companies are being asked to deliver the same high quality work with fewer resources at their disposal. This is starting to increase risk in the business.

Global competition and volatile markets are creating a challenging business climate for project-based firms which leave them with little room for error when managing projects. Asset intensive industries have their own individual challenges when it comes to managing their asset's lifecycles, but one area that is often overlooked or pushed off until the last minute is the decommissioning phase of their assets. The key to decommissioning is delivering projects and milestones on time and within budget. However, as the number of moving parts in a project increases, so does the difficulty in maintaining visibility and control. Companies need to take a holistic approach to enterprise project management to reduce risk in the business and be successful.

Based on the experiences of over 600 respondents, this report will explore proper asset lifecycle management. Specifically the decommissioning phase of an asset's lifecycle - how it needs to be treated like its own major capital project and planned for now while the necessary resources are present.

Project Management Landscape for Asset Intensive Industries

In project-based business, there is a unique set of challenges when it comes to managing both customer-facing requirements and operational processes. Many projects are complex and have a large number of milestones and process checks. These milestones are usually tied directly to the financial performance of the project. The wide range of tasks may include bidding and estimating project costs, working collaboratively across distributed teams, and managing multiple resources (whether people or assets.) These processes must be managed effectively in order to deliver projects successfully on-time and under budget.

For asset intensive companies, the speed at which an asset goes on line is a high priority; because of this, the retirement phase is frequently an afterthought. There is no production loss by not

Sector Definition

Asset intensive industries include, but are not limited to: oil and gas, mining, metals and metal processing, energy and utilities, and chemicals.

For the purposes of this paper, all of the "Asset Intensive Industries" data comes from respondents in either the Oil & Gas or Energy/Utilities industry.

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finishing a decommissioning project on time. It, ultimately, comes down to opportunity cost. By not finishing a decommissioning project on time and within budget, additional resources will be needed to complete the project. These are resources that could have been used to invest further in the business. Companies that have put plans in place ahead of time to decommission their assets reap the benefits and this gets carried over into future projects.

Also, in asset intensive industries, physical assets form a significant proportion of the total assets of the organization. These industries face the harsh realities of operating in highly competitive markets and dealing with critical assets and equipment where each failure is disruptive and costly. At the same time, they must also adhere to stringent Environment, Health, and Safety (EH&S) regulations.

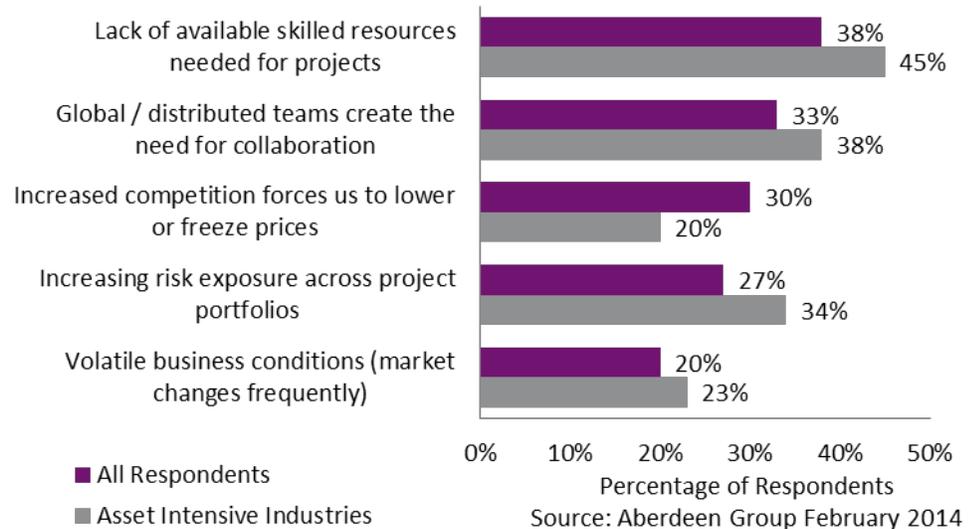
The largest pressure driving all companies, especially asset intensive ones, is the lack of talent and resources that are present today (Figure 1). In fact, recent [Aberdeen research](#) has shown that over 60% of companies feel they are understaffed in their high skill positions. When you factor in the growing practice of globalization, a scenario is starting to build that is straining the ability of asset intensive companies to hit time and cost targets for their projects. Asset intensive project-based companies are being asked to deliver the same high quality work with fewer resources at their disposal. This is starting to increase risk in the business. These organizations have no choice but to work smarter and focus their attention on managing costs for all of their projects. This is especially important when it comes to decommissioning. There is a tendency to make the retirement phase of an asset an afterthought, companies must plan now before these aging workers retire and are no longer available to assist.

"Time and cost management are always challenging for the project managers. Sometimes fast work will reduce cost and in some cases it will increase cost. Optimizing both time and cost can be achieved through experience, technical knowledge and cost consciousness."

~ Project Manager
Mid-Size Utilities Company

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Figure 1: Unique Pressures for Asset Intensive Companies



39% of Asset Intensive companies identified inefficient and/or manual project management processes as a top challenge they face.

This business environment is difficult enough to wade through. But, if you throw in the fact that a lot of companies still rely on manual processes to manage all of their projects it almost becomes impossible. Automating the process for asset intensive industries (see sidebar) would do wonders for the business. Companies need an efficient and holistic system to make effective decisions. A manual system has a trickle-down effect into visibility and change management, a key component of successful project management.

Defining Asset Intensive Leaders

Aberdeen used four key performance criteria to distinguish the asset intensive Leaders from Follower organizations (Table 1). The primary goal of a project manager is to deliver his or her projects correctly, on-time and under budget. This is especially true for decommissioning projects, as there is no profit for this phase of an assets lifecycle, unlike other capital projects. In addition, Aberdeen also factors the speed at which these companies are able to make decisions. The final criterion is, for those projects that are late, how late are they.

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Table 1: Top Performers Earn Leader Status

Definition of Maturity Class	Mean Class Performance
Asset Intensive Leaders: Top 33% of aggregate performance scorers	86% of projects delivered on-time or early 95% of projects are delivered within budget 21% Decrease in time-to-decision over the past year 14% increase in project length when a project is late
Asset Intensive Followers: Bottom 67% of aggregate performance scorers	47% of projects delivered on-time or early 65% of projects are delivered within budget 10% Decrease in time-to-decision over the past year 30% increase in project length when a project is late

Source: Aberdeen Group, February 2014

Clearly the asset intensive Leaders are doing something right, nearly every one of their projects are delivered within budget with 85% on schedule or early. The asset intensive Followers cannot say the same, which is a direct result of their slower time-to-decision.

Managing Assets throughout their Lifecycle

Asset management can be broadly looked at as the design, construction, operation, and decommissioning of plants, equipment, or facilities. It is the responsibility of management to ensure that from an assets conception to retirement that maximum value is realized and that cost is minimized. So from a macro point of view, management of capital assets can be viewed as one large overarching project that is made up of smaller individual projects that represent each phase of an assets lifecycle. To understand what makes Leaders so successful, we will examine the overall approach they take towards asset lifecycle management (Figure 2).

“Over the years, we have placed emphasis in changing internal processes in order to benefit from adoption of new software (as opposed to adopt software to speed up/support traditional processes). We have gained better control of project execution processes and enabled better decision making. One of the challenges of implementing this change was convincing people of the benefits and to factually cooperate in their own interest, at all levels of the organization.”

~Consultant
Large Oil & Gas Company

Figure 2: Decommissioning is an After Thought

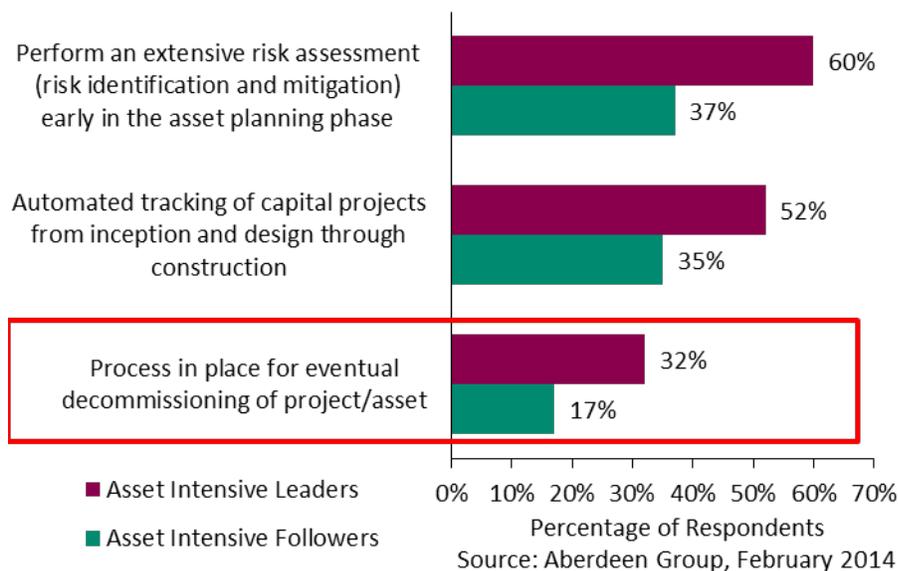


Figure 2 shows that asset intensive industries as a whole, especially Leaders, have a higher focus on the early stages of an assets lifecycle. However, the very nature of asset intensive industries plays into this focus on the initial phases. Companies in asset intensive industries inherently require larger capital expenditures than non-asset intensive companies. This in turn causes their performance to be largely dependent on the return they get from those investments. When those assets are not running or are otherwise unavailable, the company is not making money. The speed at which a company can bring a new project online becomes a much higher priority.

In addition, companies are constantly asking their production managers to squeeze every last drop of productivity out of their assets, often going past original end-of-life targets. Combine these asset intensive specific drivers with the overall business pressure of limited resources and the situation arises where the decommissioning phase becomes an afterthought (see sidebar).

36% of Asset Intensive companies stated contention for limited resources as the top pressure felt to effectively manage multiple projects.

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There is a real demographic issue that is on the horizon; the resources just aren't out there. This is why companies need to put a plan in place for decommissioning immediately. The employees who built and/or operate an asset possess intrinsic/tribal knowledge that needs to be considered when decommissioning. For example, nuclear power plants are designed for an operating life between 30 to 60 years till they inevitably need to be retired. The odds are that the workers who built these plants will no longer be around towards the end of the assets lifecycle. Companies need to capture the knowledge of these workers while they are there, and plan ahead for decommissioning.

Decommissioning an asset is both a technical and administrative process. Nuclear decommissioning is a particular challenge because it includes the cleanup of radioactive material as well as the demolition of the plant. Leaders in the industry know the challenges associated with decommissioning and have started to address this phase ahead of time factoring in items like:

- ➔ Determining the option or method for decommissioning (SAFSTOR, DECON, Entombment)
- ➔ Submitting and obtaining relevant licenses (NRC in the US, European Commission in the EU)
- ➔ Providing decommissioning funding assurance through multiple levels of requirements (minimum funding assurance, annual adjustments, continual reporting on funding status, etc.)
- ➔ Detailed cost estimates for decommissioning (required five years prior to the site's operating license expiring in the US)

SAFSTOR (Safe Storage): This option postpones the final removal of controls for a longer period, usually on the order of 40 to 60 years. The facility is placed into a safe storage configuration until the eventual dismantling and decontamination activities occur

DECON (Decontamination): the company first decontaminates or removes contaminated equipment and materials. This lowers the radiation level in the facility and significantly reduces the potential exposure to workers during subsequent decommissioning operations

Entombment: This places the facility into a condition that will allow the remaining radioactive material to remain on-site indefinitely. This option usually involves reducing the size of the area where the radioactive material is located and then encasing the facility in a material such as concrete.

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"The biggest challenge is trying to get everyone on board with the priority of decommissioning. Too many resources are dedicated to daily work, and there is reluctance to pull them away from daily work to participate in these projects. The project office is now starting to evaluate the strain of having the same resources on multiple projects and look to better distribute these resources."

~Operations Project Manager,
Large Oil & Gas Company

In the US, a post-shutdown decommissioning activities report (PSDAR) must be submitted to the NRC within two years of shutting down the facility. Financial discipline must be stressed so that the adequate amount of decommission funds are withheld. Companies work with federal and state regulators to ensure that enough money will be available. Decommissioning funds are not under the direct control of the companies and cannot be used for any other purpose. Companies that do not plan for decommissioning ahead of time run the risk of experiencing decommissioning funding assurance shortfalls. This can require intervention by the government or resources being pulled from other projects. Waiting till the decommissioning phase is upon you places enormous risk on the business, risk that Leaders in the industry find unacceptable.

Less than a quarter of respondents had some form of plan in place for the end-life of their projects. This is hazardous approach to take, and decommissioning cannot be brushed aside. When drilling down into asset intensive companies there is some hope, almost a third of the Leaders have put processes in place to attack the decommissioning phase, an 88% advantage over asset intensive Followers.

Decommissioning Needs the Same Focus as the Rest of the Lifecycle

There are unique challenges to decommissioning for most asset intensive industries. Like the attentiveness that must be exercised in dealing with hazardous materials or working environments (ex. disposing spent rods from a nuclear plant). This is one example of the unique compliance and safety standards that must be met across sectors like Oil & Gas and Utilities. Best practices in project management should be applied to the retirement phase of an assets lifecycle. This is the

Poorly Performing Projects

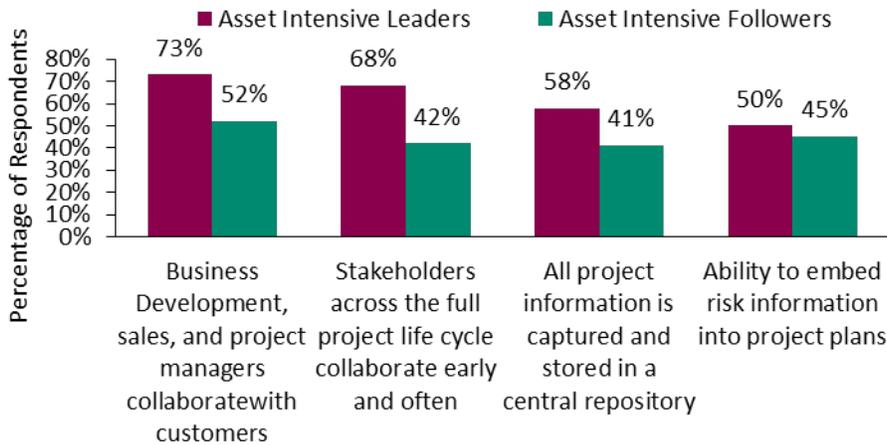
Respondents were asked to select the top two reasons that a project performed poorly. Poor performance is defined as late, over budget, or doesn't meet requirements:

- Poorly defined project requirements: **51%**
- Changes introduced after start of project: **35%**
- Time spent waiting for decisions / communication: **21%**
- Projects not adequately staffed: **20%**

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approach Leaders in the industry are taking and it all starts with setting the proper requirements (Figure 3).

Figure 3: Setting/Managing the Requirements



Source: Aberdeen Group, February 2014

As the sidebar shows, half of all poorly performing projects can be traced back to matching customer expectation. You need to set your projects up for success. Asset Intensive Leaders realize the importance of this first step and as a result focus on early collaboration with all stakeholders (project managers, contractors, governmental agencies, etc.) across the decommissioning project. Also, almost three quarters of Leaders get the customer involved early and set the right expectations with them on the work that will be done, conversely, roughly only half of the Followers undertake this practice. This early involvement validates the scope of the project, ensures that there are no surprises down the road, and what is delivered is what the customer desires.

Perhaps the most important capability that Leaders possess is their use of a centralized repository to capture and store all of the information needed for a project. This helps to eliminate those manual processes that were mentioned earlier as a daunting challenge and improves the organizations ability to

"The most beneficial thing our organization has done when it comes to project management has been migrating from a shared file server for documents to a collaborative platform environment tailored for project management. In doing so, we have been able to ensure that everyone is working on the latest version of the data and it enables greater collaboration across the organization."

~Project Manager
Medium Utilities Company

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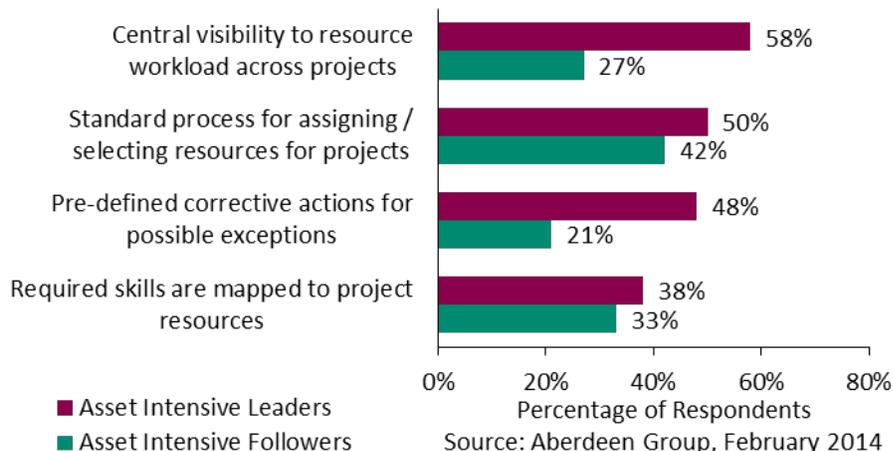
"Automating the business (project bidding) acquisition process with a CRM system that could manage multiple quotations and multiple proposals (revisions) allowed more accurate project cost estimates which led to attaining better performance throughout the project lifecycle."

~ Manager, Mid-size Oil & Gas Company

collaborate internally and externally. These repositories can also act as knowledge management tools, capturing and storing the information needed for decommissioning. This is a critical capability Leaders have an advantage in, considering that less than a third of asset intensive respondents were actively planning for the retirement of their assets. In addition, Leaders are more likely than their competitors to embed risk information into their project plans. This allows a company to be more capable of reacting to unforeseen issues, like the remediation of a site, environmental issues, public relations, etc. Software tools like centralized repositories with embedded risk information are what Leaders use to drive innovation and transform their business. They are powerful enablers in project based businesses, especially those undertaking asset decommissioning.

Now that the scope of the project is firmly set, the next step is developing a plan, optimizing it, and then executing. With the lack of resources that is being experienced both externally and internally, utilizing what is available becomes even more important (Figure 4).

Figure 4: Optimizing and Executing the Plan

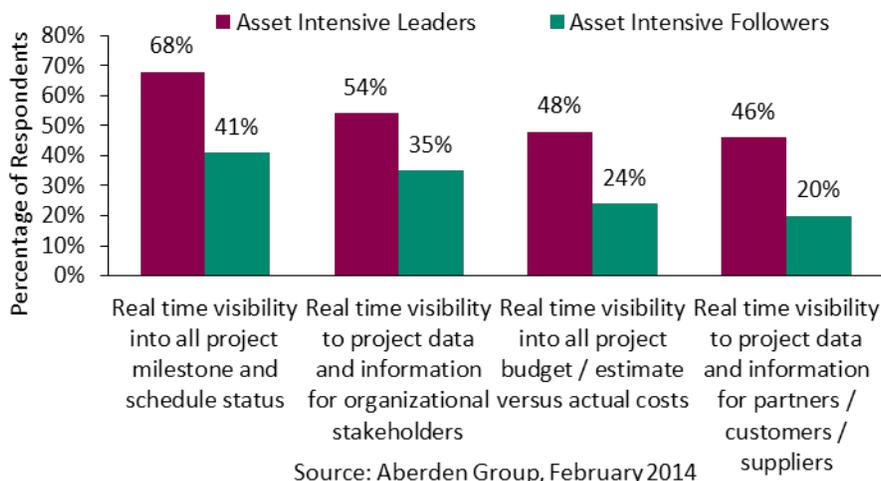


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Asset intensive Leaders overcome this challenge by providing managers with visibility into not only the resource workload across all projects in the enterprise, but also the proper skill sets of the resources available. Half the battle of resourcing a project is getting the right skillsets to work on the project and ensuring that these resources have the time to work on the project. These types of capabilities can have a profound effect on the productivity of the workforce. With the perceived lower priority that decommissioning projects have in most organizations, being able to better view and distribute workloads across all projects becomes even more important. It is because of these resource allocation capabilities that Leaders are able to hit 86% of their projects on time or early while contending for limited internal resources.

The decommissioning of an asset is a long and fluid process. Delays and unforeseen incidents are bound to happen. Companies need to be able to adapt on the fly and "re-optimize" based on any changes. This is why Leaders stress the importance of having real time visibility (Figure 5).

Figure 5: Leaders Stress Real Time Visibility



“We have improved the discipline of execution. Plans and intentions are great, but the real difference is made in execution. The challenge there of course is to get everybody - that is: including (senior) managers - to behave in a disciplined manner, even when operational pressures mount.”

~Project Manager
Large Oil & Gas Company

“We implemented an operation reporting system, which consolidated all of our disparate systems into a centralized platform. Our new system shows real time status of on-going and in-coming projects and stock inventory status. In addition, we implemented a regular program for soliciting customer feedback regarding project and service satisfaction levels, which provides us valuable insight into how to improve our business.”

~Manager
Large Oil & Gas Company

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Limiting access to project data to only select project members and project managers limits the ability of the business to respond cohesively to challenges in managing projects for profitability. Providing access to project data to all stakeholders at every level in the organization will enable better project decision making needed to contain costs. Particularly in the case of a more complex asset, specific production lines, process lines or pieces of equipment may need to be tracked as separate assets in order to support replacement and decommissioning decisions.

Asset Intensive Leaders also realize that you need to provide this visibility externally (46% of Leaders), so that all of their partners, contractors, and suppliers have access to the information that they need and are kept in the loop. This is a win-win for all parties. Leaders will better allocate the resources of their partners and the partners will find the Leaders easier to work with, encouraging lower bids and future business. This increased visibility allows a company to look forward and discover potential problems before they become issues throughout the decommissioning process. The Followers rely solely on reacting to problems as they arise, which has a severe impact on the cost and time targets for their projects. This ability is what separates the Leaders from the Followers.

Change management is important to a project but as Asset Intensive leaders know, also to the business (see sidebar.) Whether it is a revision to materials or project phasing, the addition/subtraction of work, or a cardinal change, Leaders have a standardized process to formally request a change. Following that, they have a formal process to review and approve changes in operations. In doing so, they go through the proper channels to ensure that if the change is made; it won't have an unknown impact on the business. Once a change has been approved,

Managing Change

Asset Intensive leaders understand the importance of managing change within the business:

Standardized process to formally request a change:

- Asset Intensive Leaders - 73%
- Asset Intensive Followers - 62%

Formal process to review and approve proposed changes:

- Asset Intensive Leaders - 73%
- Asset Intensive Followers - 53%

Formal process to manage and communicate changes:

- Asset Intensive Leaders - 65%
- Asset Intensive Followers - 50%

Closed loop processes for change related tasks:

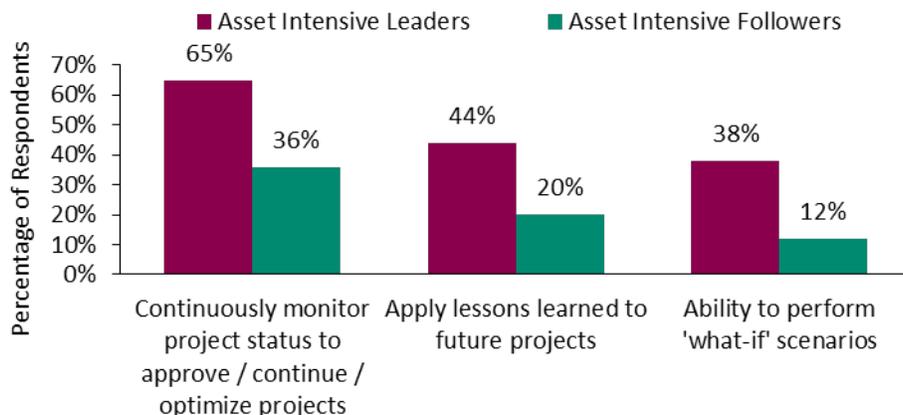
- Asset Intensive Leaders - 55%
- Asset Intensive Followers - 35%

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Leaders are also more likely to make sure that it is communicated both internally and externally, followed by having a formalized closed loop process. In doing so, Leaders ensure that change is not only communicated and understood but also implemented and adhered to.

Forming and executing the plan is not the last step when decommissioning an asset, Leaders are looking at ways they can further innovate and improve their business (Figure 6). We know that Leaders have control of their change processes, so they can now take this a step further and conduct "what if" scenarios allowing stakeholders to see how any changes will impact (positively or negatively) budget and schedule progress. Only 12% of Followers have the ability to conduct these "what if" scenarios, leaving them stuck in following out their plans as scheduled, even if it is not the most optimal.

Figure 6: Apply Continuous Improvement Thinking



Source: Aberdeen Group, February 2014

However, the most important way that the asset intensive Leaders are attacking asset decommissioning is by taking a continuous improvement mindset. Continuous improvement is a concept with its origins from the plant floor but is being injected everywhere in an organization today. Not only are Leaders

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seeing where in current projects they can improve, they are applying lessons that have been learned to all future projects. The Leaders are able to take this approach because they have aligned their business efficiently and the software they possess.

Continuous improvement is being embraced as the engine to transform the business; this plays a direct role in the superior time and cost project metrics that Leaders have seen in the last year. It is this continuous improvement approach that demonstrates the maturity of a company, if Followers don't embrace this approach they will be left behind.

Key Takeaways and Recommendations

Completing projects on time and on budget all while dealing with stringent environmental and safety standards are some of the unique challenges that asset intensive companies must deal with. The nature of these industries and the lack of talent out there often results in the decommissioning phase to become an afterthought. Leaders in the industry have already started to put a plan in place to manage this extensive project. Those companies looking to effectively manage the decommissioning phase of an assets lifecycle should:

- **Start thinking about decommissioning NOW. This phase of an assets lifecycle is just as important as any other; put a plan in place before it's too late.** Leaders are 88% more likely than their competitors to have a plan in place for decommissioning. You can't wait till the event is upon you; utilize the necessary resources while they are there to start planning.
- **It all starts with managing requirements. Leaders are more likely to get everyone involved early and set expectations.** Fifty-one percent (51%) of poorly performing projects were linked to bad requirements.

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Leaders involve all stakeholders early and often to validate the requirements and scope of the project.

- **Equip managers with the tools to plan and distribute their resources and execute the plan.** Everyone is being forced to operate while understaffed, however asset intensive Leaders provide their decision makers with the tools they need to better map out a projects needs to available resources.
- **Stress the importance of real time visibility (both internally and externally) to reduce time to decision.** Visibility is crucial for effective decision making, which is why Leaders strive for it. It also makes the company more adaptable and easier to do business with. This ability enables asset intensive Leaders to strive for operational excellence in their decommissioning projects.
- **Inject continuous improvement thinking to optimize current and future projects.** This is where Leaders separate themselves from the pack. Not only do they reap the benefits on the current project they are working on, these valuable lessons can be applied to future project to ensure repeat mistakes are not made. This sets Leaders up to better handle the intricate regulatory and financial challenges that asset intensive companies deal with on a daily basis.

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Related Research

[Closing the Talent Gap in Asset Management](#);
March 2014

[Operational Risk Management: Building a Framework to Identify, Assess, and Remediate](#);
February 2014

[Asset Management: Building the Business Case for the Executive](#); December 2012

[Project Management: Putting the Pieces Together](#);
March 2012

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