INFORMATION MANAGEMENT FOR FACILITIES AND OPERATIONS:

Knowing your gaps is key to catastrophe preparedness

In Partnership with

ARC®   **⊞aiim**

About this eBook

As the non-profit association dedicated to nurturing, growing and supporting the user and supplier communities of Information Management and Social Business Systems, AIIM is proud to provide this research at no charge. In this way, the entire community can take full advantage of the education and thought-leadership direction provided by our work.

We are happy to extend free use of the materials in this report to end-user companies and to independent consultants, but not to suppliers of Information Management systems, products and services, other than ARC®, its subsidiaries, and its partners. Any use of this material must carry the attribution – "© AIIM 2017 www.aiim.org / © ARC® http://www.e-arc.com". Rather than redistribute a copy of this report to your colleagues, we would prefer that you direct them to www.aiim.org/research for a download of their own.

Our ability to deliver such high-quality research is made possible by the financial support of our underwriting partner, without whom we would have to return to a paid subscription model. For that, we hope you will join us in thanking our underwriter for their support:

ARC®

1981 N. Broadway Suite 385
Walnut Creek, CA 94596
(855) 500-0660
www.e-arc.com
Leaders in Mobile Facilities Dashboards

Process Used & Survey Demographics

The survey results quoted in this report were collected from individual members of the AIIM community and individuals solicited with the help of ARC®, using a web-based tool. Invitations to take the survey were sent via email. Analysis of the collected data was conducted by AIIM and ARC® analysts, and the report was independently written by AIIM. Invitations to take the survey were sent via email to a selection of AIIM's 190,000+ registered individuals.

About the author

Bob Larrivee
Vice President and Chief Analyst of Market Intelligence, AIIM

Bob Larrivee is Vice President and Chief Analyst of AIIM Market Intelligence. Internationally recognized as a subject matter expert and thought leader with over thirty years of experience in the fields of information and process management, Bob is an avid techie with a focus on process improvement, and applying advanced technologies to solve business problems, improve business processes, and automate business operations.

© 2017

AIIM

1100 Wayne Avenue, Suite 1100
Silver Spring, MD 20910
+1 301 587-8202
www.aiim.org

© 2017

ARC®

1981 N. Broadway, Suite 385
Walnut Creek, CA 94596
(855) 500-0660
www.e-arc.com

About AIIM

AIIM has been an advocate and supporter of information professionals for nearly 70 years, ensuring that information professionals understand the current and future challenges of managing information assets in an era of social, mobile, cloud and big data. AIIM represents the entire information management community: practitioners, technology suppliers, integrators and consultants. AIIM builds on a strong heritage of research and member services providing independent research and educational programs to information professionals, which can be found at http://www.aiim.org/Training.

Introduction

While natural disasters cannot be prevented, they can be and must be prepared for. Understanding the risk of not being prepared is the first step in emergency preparedness, and directly applies to facilities management. However, in this new age of information, it is not the physical reinforcements and preparations taken on premises that matter most to the disaster readiness of a facility. Rather, what matters most are the contingency plans in place for the storage and protection of records, documents, and information that are foundational to facility operations. Today, information is the raw material of any facility, and that facility's information must be properly protected, insured, and controlled in times of crisis.

Equipment manuals, blueprints, building plans, permits, and improvements: these are all part of a wide range of vital documents that facilities management professionals are responsible to manage, control, and derive value from for facilities projects and maintenance. For every facility document, there's a real-world equivalent affected by its contents—perhaps machinery, a boiler, or an entire building. All it takes is one document, a single missed keystroke, an erroneous typo, or misplaced plan, and the repercussions can prove ruinous for facilities managers, contractors, citizens, and first responders alike.

As you'll see below, (Figure 1) given the high percentage of documents that are still stored in their original paper form, or on computer drives or facilities management software, the risk of documents being challenging to retrieve or being damaged in a catastrophe is relatively high.

Figure 1. How do you currently manage your facilities, operations, and engineering documents related to your buildings and plant maintenance and equipment
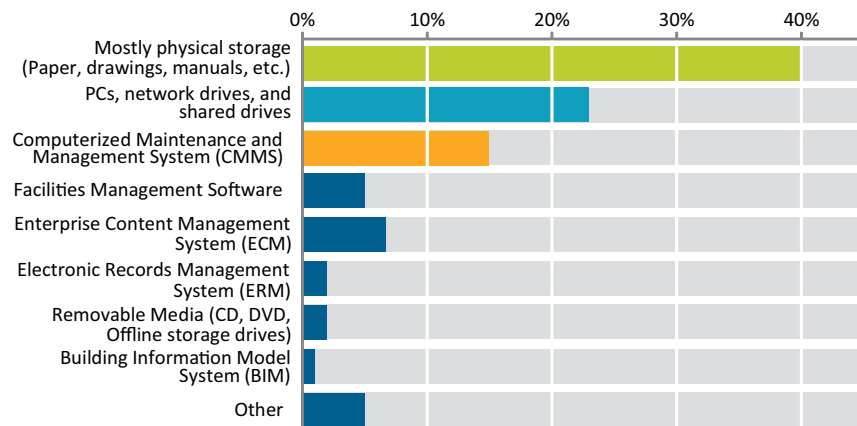
Under perfect conditions, a flawed information infrastructure leads to problems. When stressed by a disaster, the fallout could be severe. In this eBook, we delve into the pain points experienced by facilities managers: from converting their paper documents to digital, the specific types of catastrophes they face and their associated costs, the challenges of an aging workforce, and the steps they are taking to future-proof their operations.

Catastrophes – Frequency and Cost

What qualifies as a potential catastrophe for your business? At the time this report was written, Hurricane Maria had just devastated the island of Puerto Rico, earthquakes had hit Japan and Mexico, and the United States was recovering from two of the most devastating hurricanes in its history. Hurricane Irma was the largest hurricane in the history of the State of Florida, and Hurricane Harvey was a storm that caused flooding never seen before in the State of Texas.

While these most certainly qualify as catastrophic events, a catastrophe can also be an event that is smaller in scale. For the purposes of this report, and the related survey, we defined a facilities catastrophe as "any unplanned event that costs the organization $150,000 or more", and asked our respondents to estimate how many of these their organizations had experienced in the past ten years. Based on this, we found the following:

- The average facilities team faces a catastrophe every 2 years

- The average facilities team manages 20 buildings

- On average, each building suffers a catastrophe every 40 years

- The catastrophe frequency based on the number of buildings managed is:

    - >20 buildings = every 1.7 years

    - 11-20 buildings = every 2.2 years

    - 1-10 buildings = every 3.1 years

When looking at the types of catastrophes companies have faced over the past ten years, the most commonly reported are power equipment failures. Fifty-nine percent of companies report this as the most common catastrophe. As we see here, the weighted average cost far exceeds the $150,000 target we set, hitting the $506,906 mark. *(Figure 2)*

Types of Catastrophes in past 10 years	# of buildings owned/managed			Average Cost /Catastrophe
	1–20	>20	Overall	
Power Equipment Failure (Breakers, Boiler, HVAC, etc.)	57%	61%	59%	$372,754
Water (Floods, Tsunamis, etc.)	42%	66%	55%	$599,130
Wind related (Hurricanes, Tornadoes, etc.)	27%	43%	36%	$634,302
Human incurred (Vandalism, etc.)	19%	43%	33%	$208,214
Medical (Accidents, Health, Violence, Materials, etc.)	14%	35%	26%	$347,322
Fires	5%	40%	25%	$806,205
Gas/Electrical (Gas leaks, Explosions, HazMat, etc.)	8%	23%	16%	$481,621
Safety (Active Shooter, Lockdown, Hostage, Bomb Threat, etc.)	1%	9%	6%	$384,354
Earthquakes and Avalanche	4%	2%	3%	$742,272

Weighted Average Cost/Catastrophe -->	**$506,906**

The costliest catastrophes reported are fires at more than $600,000, but water catastrophes have been reported to be the most difficult to resolve according to most of our respondents. *(Figure 3)*
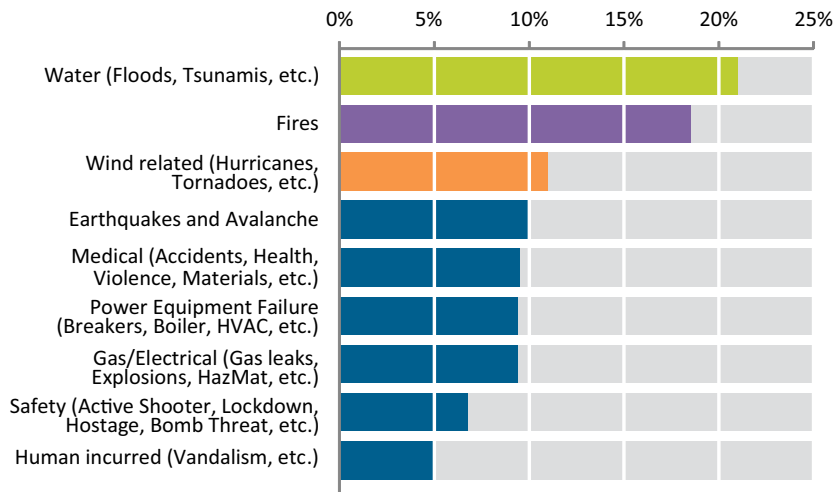

Figure 2. What types of catastrophes would you say your company has experienced in the past 10 years, and what would be the cost of a catastrophic event?

Figure 3. What types of catastrophes would you say are the most difficult to resolve?

Regardless of the type of catastrophe, responsiveness is key to recovery. For example, water catastrophes can occur as the result of a small problem, like a pipe burst, requiring the need to find a shut-off valve to stop the flow of water. If the response team must

locate a paper file to identify the shut-off, that is time wasted with potential damage increasing. Further, a slow response can result in mold buildup over time, causing more damage and increasing the time and costs to repair.

Additionally, 37% of our respondents report their biggest information management challenge post-catastrophe is bringing their systems back online. For another 36% of our respondents the biggest challenge is getting access to their information. *(Figure 4)* The indication here being that if systems are located on-premise, time is needed to set up new hardware, retrieve back-up copies of the software and restore them, if possible. And if the documents are in paper form, there is a good chance they will be lost forever.

Figure 4. In your opinion, what is the biggest information management challenge when facing a catastrophe?
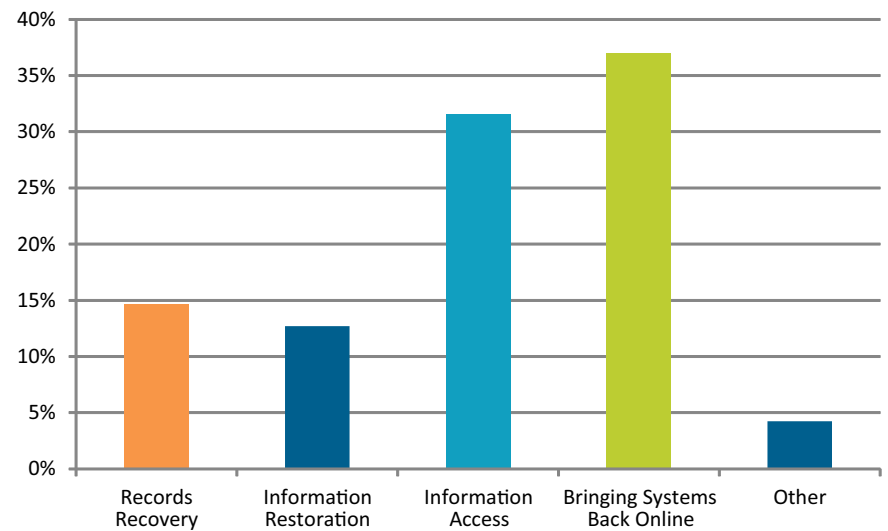
Information management of policies and procedures related to an emergency response is also a critical element in dealing with a catastrophe. Fortunately, our respondents, for the most part, do in fact have emergency policies and procedures in place with only 16% reporting that they do not.

Of those that report having policies and procedures, 41% cite that they are in paper form, meaning that, should something happen, they may not have access to the physical location where they are stored, rendering those documents useless. Of those who cite having digital policies and procedures, 29% report that they are in the cloud and 14% that they are accessible on mobile devices, indicating that they truly are more prepared. *(Figure 5)*
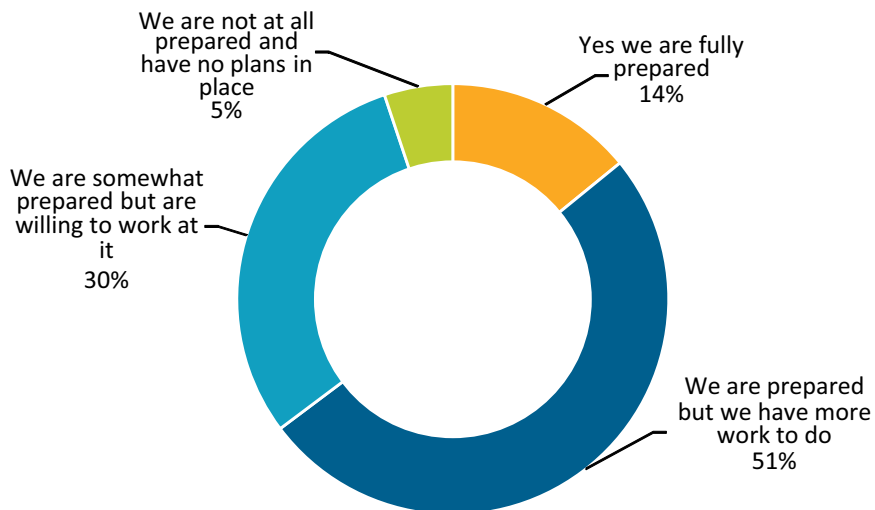
Figure 5. What kind of emergency policies do you have in place, with regard to your facilities and operations information and records?

Answer	%
We have no policies in place presently	16%
We have written policies and procedures in paper form	41%
We have policies and procedures in digital form accessible in the cloud	29%
We have digital policies and procedures available on mobile devices	14%

So, are companies and their workforces prepared for disaster when it comes to their Facilities, Operations and Engineering information? Or at least do they think they are? According to our research, the answer is yes. Most responders believe they have made great progress, but know there is more work ahead. In fact, 81% of our respondents feel they are prepared but have more work to do (51%), or are somewhat prepared but are willing to work at it (30%). Only 14% feel they are fully prepared for a catastrophic event and of course the only way they will find out, is when that happens. *(Figure 6)*

Figure 6. In your opinion, is the workforce in your company prepared for disaster when related to your Facilities, Operations, and Engineering information?

We are not at all prepared and have no plans in place
5%

Yes we are fully prepared
14%

We are somewhat prepared but are willing to work at it
30%

We are prepared but we have more work to do
51%

Taking Preparedness to the Next Level is Critical

When you look at the data presented here, you find that facilities teams are likely to face a catastrophe on average every two years, with an average cost of $500,000 per catastrophe. Given this probability, and the anticipated cost, it is in the best interest of the organization and facilities team to be more proactive in managing their information in preparation for a catastrophic event to minimize the impact when it does occur.

This means having current building information, including all current As-Builts for the Facilities teams, ideally, stored in the cloud and accessible on mobile devices. This includes all emergency policies and procedures. Facilities teams should be conducting regular maintenance on their equipment and their facilities documentation. In many cases, it would be beneficial to rehearse emergency responses to ensure emergency information procedures work, documents are accessible, and processes are in place to equip workers for responding quickly without wasting time searching for the vital information they need in an emergency.

Maintenance, Productivity, Preparedness

Maintaining facilities equipment and related documentation is vital to loss prevention and lowering recovery costs. It could also make a difference in increasing productivity and lowering the costs of overtime hours and off-hour calls. Of course, there is no guarantee of that; but if everything is well maintained, the likelihood of breakage and downtime is decreased. Our research finds that on average, Facilities, Ops, and Engineering teams incur 50 hours of overtime per month or 1.1 hours of overtime per team employee.

What preventive maintenance measures do you take for your facilities and do you ever miss any? According to our research, the average facilities team misses preventive maintenance at least six times per month.

Breaking it down, based on the number of buildings managed, it turns out to be:

- >20 buildings = 9 times per month
- 1 – 20 buildings = 4 times per month

Facilities teams are falling behind on preventive maintenance, as shown by our data, and this could be the result of time spent searching for the information they need to perform their maintenance tasks. (Figure 7) Using a weighted average, our findings show that on average, a member of a Facilities team will spend approximately forty-seven minutes per day searching for or waiting for building information each day. When you look at the number of team members and the cost that represents, it all adds up very quickly.

Figure 7. Please estimate how many hours per day the typical person on your Facilities team spends searching for or waiting for building information? (e.g. floor plans, shutoffs, permits, warranties, etc.)

| Number of Buildings	Minutes Spent Per Day, Per Person
1-10	47
11-50	47
51-100	30
101-250	52
250+	45
Total	47

Weighted Average = 47 Minutes

When we asked about the importance of having current As-Builts for all their buildings in relation to the productivity of facilities staff, the majority reported it as fairly important (23%) to very important (55%) to them. Yet, when asked if they have accurate and current building documentation (i.e. current As-Builts) for every building, more than half admit they do not. (Figure 8) This begs the question. How much time will have to be spent searching for the most current documents during an emergency – and at what cost?

Figure 8.

How important is having current As-Builts for all your buildings for the productivity of your facilities staff? (1=not important at all/5 = very important)

Very important (5) — 55%
Fairly important (4) — 23%
Important (3) — 14%
Slightly important (2) — 6%
Not important at all (1) — 3%
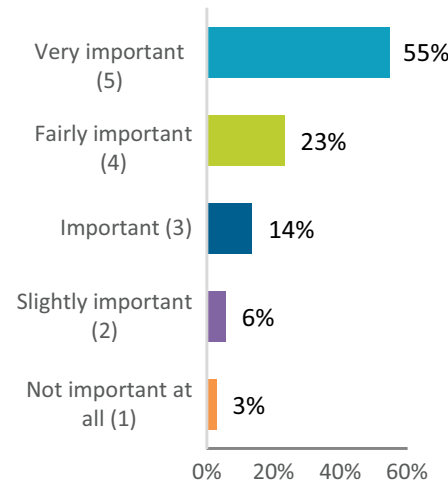
Does your facilities team have accurate and current building documentation (i.e. current As-Builts) for every building?

1-10 buildings — 51%
11-20 buildings — 45%
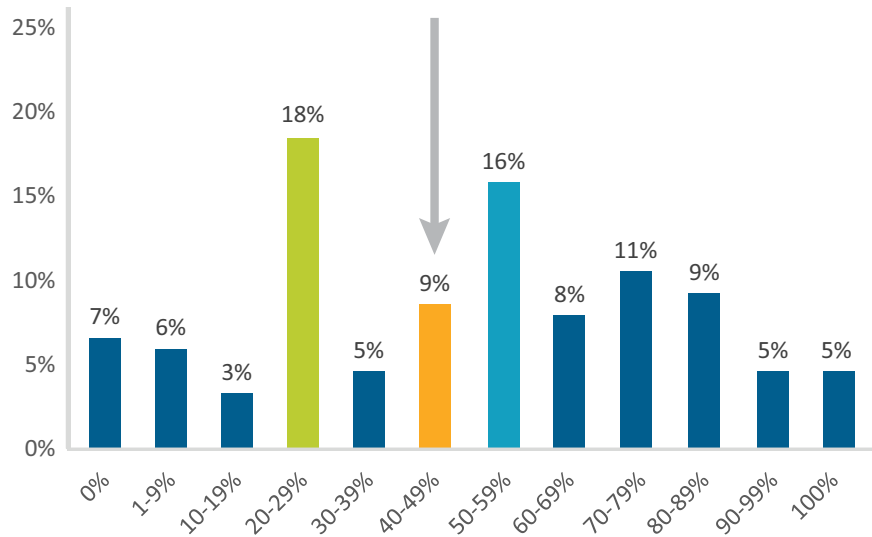>20 buildings — 49%
Overall Average — 49%
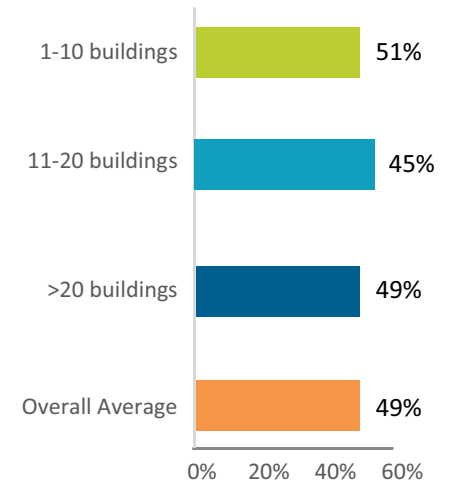
So where is all this vital information stored? Our research finds that the bulk of it, nearly two-thirds is stored locally with most (40%) reporting it is stored in physical form (paper, drawings, manuals, etc.), and, when in digital form, on PCs, network drives, and shared drives (23%), placing all of this at high risk of loss or damage. (Figure 9) It also means access to, and the sharing of these documents are limited which brings us back to our discussion about maintenance costs and productivity. Facilities teams frequently have to search in multiple locations for the documents they need to perform their routine maintenance tasks.

As mentioned in the Introduction of this eBook, given that most of the documents related to buildings, plant maintenance, and equipment are managed physically, it is of little surprise that less than half of the important facilities information (plans, specifications, operations and maintenance, warranties, etc.) is stored digitally. (Figure 1 in Introduction)

Figure 9. Approximately how much of your organization's important facilities information (Plans, Specs, TIs, O&Ms, Warranties) is stored digitally?
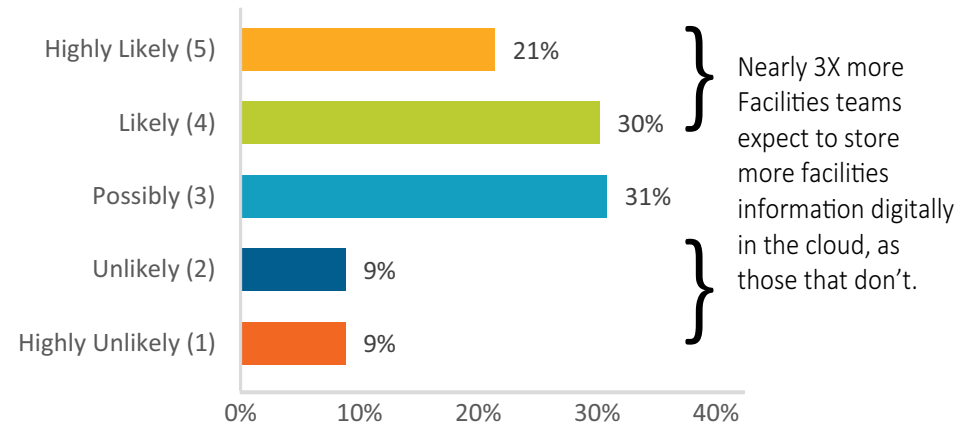
Figure 10. Over the next 2 to 5 years, how likely is it that your organization will store significantly more of its facilities information digitally in the cloud?

Weighted average = 46%

Nearly 3X more Facilities teams expect to store more facilities information digitally in the cloud, as those that don't.

Another area of opportunity and one that is often overlooked is that of warranty information. Time and money is unnecessarily spent on repairs for equipment that is under warranty; but no one realizes this, due to the fact that the information is not readily available. We found that, on average, facilities teams pay an average of $81,000 per year in repair costs on equipment that is currently under warranty. Here is how it breaks down by the number of buildings managed:

- >20 buildings = $117,500 per year
- 1-20 buildings = $23,500 per year

Looking ahead out over the next 2 to 5 years, it seems more likely that organizations will be storing significantly more of their facilities information in the cloud than they do now. Our data shows that nearly three times more facilities teams expect to store a higher percentage of their facilities information in the cloud than those that don't expect to over the next five years. *(Figure 10)*

Moving Information to the Cloud is Critical

Maintenance of equipment and facilities is a sound investment practice, but so is the practice of maintaining the information ecosystem. When you consider that potentially, the equivalent of 1 out of every 5 Facilities/OPS/Engineering headcount is considered lost productivity – time spent looking for the information required to perform their duties, it makes sense that an increased focus should be placed on improving information management.

Instant access to building information on mobile devices, in addition to providing for emergency preparedness, provides substantial productivity savings. Additionally, securing this information, along with all warranty information, will help eliminate repair costs on warrantied equipment, potentially saving an average of $81,000 per year. When you consider that the typical facilities team spends an average of $50,000 per year on overtime costs, transitioning to cloud storage and providing mobile access to digital building information would reduce these costs significantly. With the new generation of Facilities, Operations and Engineering workers entering the workforce, digital storage and mobile access will no longer be a luxury, it will be expected.

The Changing Face of the Workplace

As with any business, there is a transition in the workforce that must be recognized and addressed. Facilities, Operations, and Engineering is no different. Employee turnover, off-duty or on-call requirements, technology changes, and training are all part of an ever-changing workplace that businesses must manage to ensure their readiness to address not only day-to-day activities, but also disaster preparedness.

In Facilities, Operations, and Engineering, employee turnover may not be as large of a problem as some other segments like customer service for example, as many who pursue these roles tend to stay with them throughout their career. As a result, it does mean there is the potential for a high turnover rate in teams as the workforce ages, creating another business risk. This was validated by the research derived from this study, when we calculated the weighted average of Facilities team workers that are 55 years of age or older. *(Figure 11)*

Figure 11. Retiring workers is a challenge facing nearly every facilities team. On average, 29% of Facilities Team workers are 55 years or older.
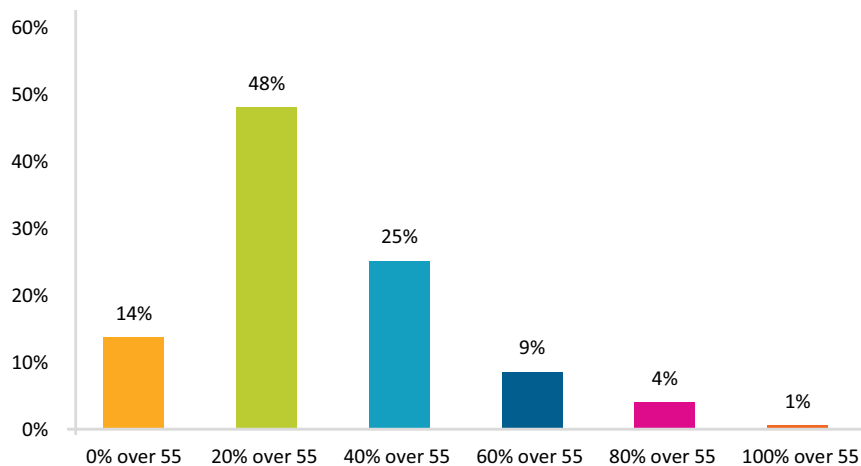

Considering this developing situation, the transfer of experiential or "tribal" knowledge must be included as a key element of any training program for new employees. Whenever possible, knowledge transfer should take place between the current workforce and the next generation to pass along not only technical knowledge,

but also experiential knowledge, which can only be accumulated from actual work experience. This approach can strengthen succession planning for Facilities teams.

This is where capturing information and storing it digitally becomes even more critical. Not only can the paper documents be captured, but information about the actions taken during a maintenance task or shut-down procedure, as well as documenting abnormalities, and areas of concern or lessons learned, can be documented and stored digitally for the next person assigned to undertake this task. Finally, storing these digital documents in the cloud and making them available via mobile devices facilitates anywhere, anytime access.

Figure 12. How long does it take to train new Facilities/OPS/Engineering staff before they are fully productive?
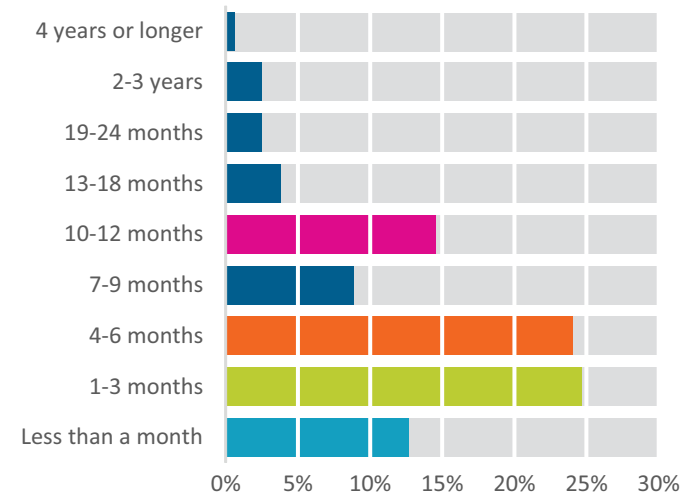
Successful management of facilities, operations, and engineering also requires comprehensive staff training. When new employees enter the workforce, it is not a matter of simply handing them an employee badge and pointing them in the right direction. Staff training is required on many levels related to the facilities, policies, equipment, and any specific regulatory requirements that must be followed.

As mentioned previously, experiential or "Tribal" knowledge is also a valuable component of new employee training. Transfer of this knowledge can be instrumental for equipping future leaders in facilities management. When asked about the time it takes to train staff before they are considered "fully" productive, twenty-nine percent report it takes between one and three months while twenty-three percent told us it takes four to six months of training. *(Figure 12)*

Preserving Experiential Knowledge is Critical

If a senior manager leaves after giving a month's notice, there simply isn't adequate time to transfer all practical knowledge to a replacement hired to fill the position. That's where documenting the experience, storing the material and making it available to the entire facilities team becomes a significant value-add.

Embracing Emerging Technology: Building Information Model (BIM)

Technology is another area of change in the facilities workplace. As we saw earlier in this report, information can be stored and managed in a computerized maintenance management system (CMMS). Beyond the CMMS is the Building Information Model (BIM). Typically, providing multidimensional building representations of buildings, BIM will centralize various information elements of a project – from design, to construction, to owner/operator. While it seems this might be a good direction for facilities teams to explore, twice as many of our respondents say it is unlikely they will start using BIM in their facilities operations within the next 24 months as those who say they will. *(Figure 13)*

Figure 13. How likely are you to start using Building Information Models (BIM) in your facilities operations within the next 24 months?

	%	
Highly Unlikely	18%	}46%
Not Likely	28%	
Possibly	32%	
Likely	14%	}22%
Highly likely	8%	

Conclusions

Catastrophes can strike at any time and in any location. And they can be natural, or man-made. How well we are prepared can mean the difference between recovery and a disastrous loss of business. Even if most of the information is stored in digital form rather than paper, is it readily available and accessible? More importantly, would it be available and accessible on a mobile device in a remote location? Not only is this true when catastrophic events occur, but also during times of daily work routine and productivity. Information should be readily available to those who need it, when and where they need it.

There is a real opportunity for improvement in the management of facilities, operations and engineering documents and information in general. As-built information, and all project-related information must be maintained accurately not only for maximum productivity, but also for speed of responsiveness in times of crisis. Organizations maintaining multiple facilities have an opportunity to standardize their operations and build a collaborative ecosystem to support their facilities document lifecycle efforts. This will help them address issues related to inaccurate information, increased operational costs, and unnecessary expenditures like services costs that should have been covered by warranty.

There are many solid business reasons for moving to a more digital environment and implementing cloud and mobile technologies, to enable immediate access to vital building information on a twenty-four seven basis from any location. This not only eliminates costly time wasted searching for hardcopy information, it can also ensure, with the use of the right technologies, that the most up-to-date information is provided at the exact moment it is needed.

Recommendations

- Document a process and pinpoint where information enters your business and processes. Identify who is accessing this information, what information they seek, and require.

- List the sources of this information, where it resides, and evaluate how it can be brought to the user through a single point of entry – the cloud.

- Provide the technology and training to enable the project team members to access this information in ways that align to their business needs and activities.

- Look for technology solutions that support the use of placeholder documents, automatic document numbering/versioning

- Adopt work processes and technology that support best practices for your facilities, operations, and engineering document and information asset lifecycle – from creation to destruction
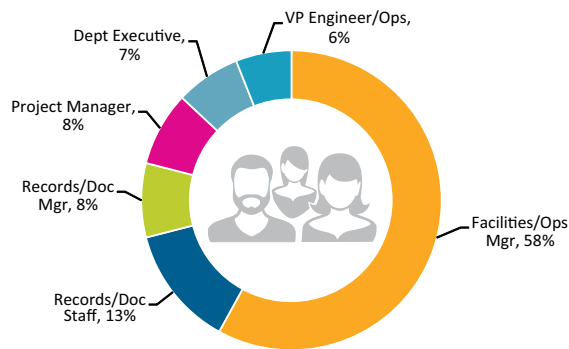
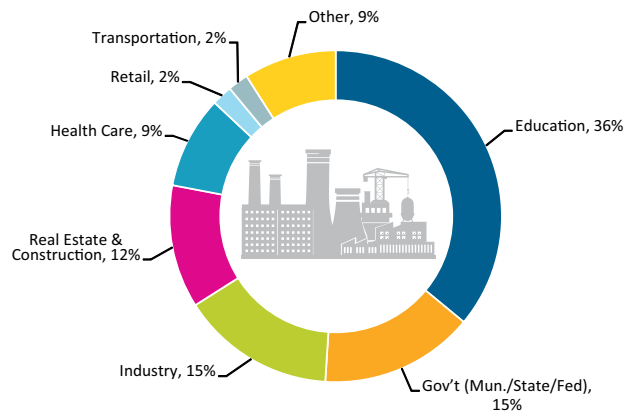- Promote successes within your organization.

Demographics

The results presented in this report were gathered from one hundred and seventy-nine respondents who completed the survey and had the following titles:

- Facilities, Operations, Plant Manager
- Vice President Engineering or Operations
- Head of records/information management
- Project Manager
- Line-of-business executive, department head or process owner
- Records, Archivist, or document management staff
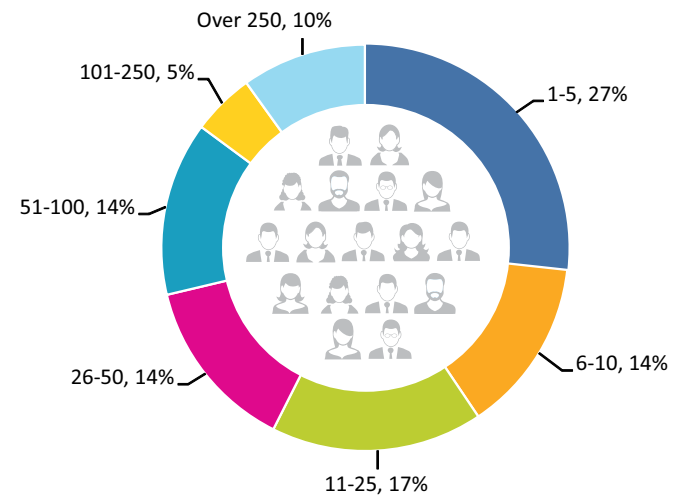
The breakdown of respondents is as follows:

- VP Engineer/Ops, 6%
- Dept Executive, 7%
- Project Manager, 8%
- Records/Doc Mgr, 8%
- Records/Doc Staff, 13%
- Facilities/Ops Mgr, 58%

The industry sectors they represent include:

- Other, 9%
- Transportation, 2%
- Retail, 2%
- Health Care, 9%
- Real Estate & Construction, 12%
- Industry, 15%
- Gov't (Mun./State/Fed), 15%
- Education, 36%

Here is the breakdown of the number of buildings or facilities their companies own, manage, or are responsible for:

	1-5	6-10	11-15	16-20	More than 20
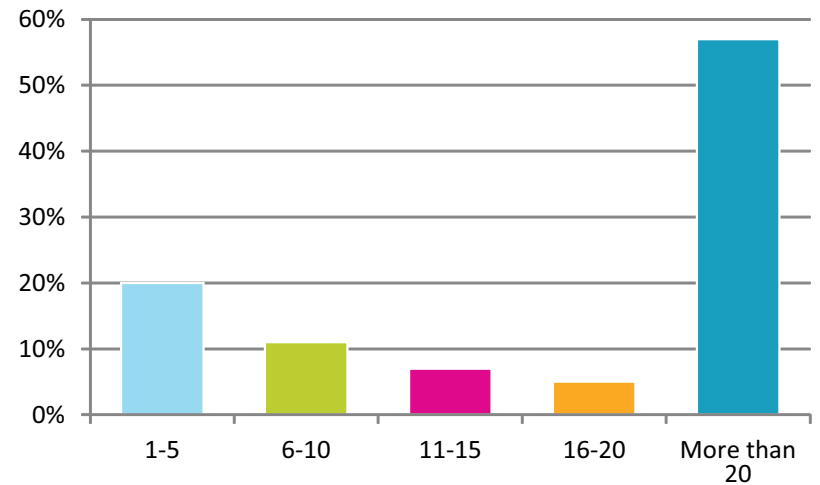
This is the number of employees on their facilities teams:

- Over 250, 10%
- 101-250, 5%
- 51-100, 14%
- 26-50, 14%
- 11-25, 17%
- 1-5, 27%
- 6-10, 14%

About ARC

ARC® provides technology and document solutions for every stage of the building lifecycle and is the leading provider of mobile facilities dashboards to facilities teams. Solutions that deliver productivity improvements and cost savings by providing instant access to accurate facilities information anytime, anywhere — on any device. Facilities managers use our mobile dashboards to view, update and share documents for maintenance requests, during construction projects, and in the event of an emergency. ARC® has over 90,000 customers and 190 offices worldwide. NYSE: ARC®.

For more information about ARC's Mobile Apps, please visit:

e-arc.com/technology-solutions/facilities

or call (855) 500-0660.

About AIIM

AIIM (www.aiim.org) is the global community of information professionals. We provide the education, research and certification that information professionals need to manage and share information assets in an era of mobile, social, cloud and big data.

Founded in 1943, AIIM builds on a strong heritage of research and member service. Today, AIIM is a global, non-profit organization that provides independent research, education and certification programs to information professionals. AIIM represents the entire information management community, with programs and content for practitioners, technology suppliers, integrators and consultants.

© 2017

AIIM
1100 Wayne Avenue, Suite 1100
Silver Spring, MD 20910
(+1) 301 587-8202
www.aiim.org

AIIM Europe
Office 1, Broomhall Business Centre,
Broomhall Lane, Worcester, WR5 2NT, UK
+44 (0)1905 727600
www.aiim.org