

How Agile Emergency Management improves disaster response logistics, reduces frontline stress and delivers better cost control

A project manager's guide to emergency management and Incident Command System



WHITE PAPER

Abstract: In some ways, emergency response is similar to any traditional, project. There are tasks, resources and timelines. This suggests project management methods can help emergency responders to improve the efficiency of Incident Command System (ICS) protocols.

Incident Command's successful employment of Agile Emergency Management during the Deepwater Horizon oil spill backs this up. When introduced several months into the emergency response, this hybrid of ICS and Lean delivered better long-term forecasting of resource and response requirements, improving remediation management as well as cost control.

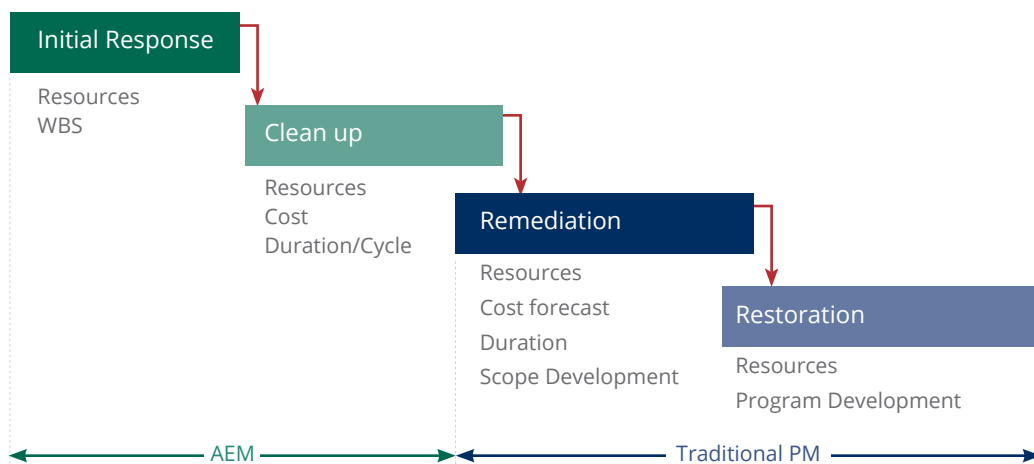
OVERVIEW

As an Incident Commander in several emergency responses and as a career project manager, NOVACES have found that the dichotomy of incident unknowns and scope control present a unique niche for project management principles in emergency response. In this paper, NOVACES will present a different view of managing an emergency and, perhaps, provide solutions to both responders and responsible parties in quickly getting to meaningful planning cycles and resource management.

Let's look at the Incident Command System (ICS). This is an organizational structure comprised of Command, Planning, Logistics, Operations and Finance. Each has a specific role and pertinent activities to perform in managing an emergency response. The requirement for following ICS and the protocols within which these activities function are clearly spelled out in several laws, OPA 90 among them. Every federally directed response and most private entity responses adhere to the National Incident Management System (NIMS). The ICS structure and protocols have been proven to be an effective, functional and rapid response to an emergency when executed well. In no way does this paper suggest otherwise.

There are several stages to an emergency response, each of which can be viewed differently from a project manager's perspective. Typically they are: first, eliminating immediate risk to life and property; then cleanup, followed by remediation and restoration. Each step has specific planning cycles and resource assignment requirements within the ICS protocol. The protocol, however, does not address supply chain management, resource leveling, or scope management and control in traditional project management fashion.

Without these elements of fundamental project controls, the response is often viewed by a project manager as chaotic and inefficient. Without the principles of the Construction Industry Institute and the Project Management Institute being applied, the response does not meet the criteria by which task definition and linkage, resource allocation, schedule adherence and fiduciary accountability are integral to successful project management.





In the aftermath of Katrina, there are innumerable examples of the lack of sound project management principles being applied to the response. What has become the largest civil works project in US history (securing the New Orleans region from 100 year storm threat), was the last piece of the work breakdown structure of this particular project. First there was de-watering the city, then debris removal, then utilities restoration, followed by the return of the supply chain of food, fuel, and clothing, then design and construction of a \$15 billion system to offset hurricane surge.

As a project manager, NOVACES pose the question “when did the project aspect of all this work begin?” NOVACES propose in this paper that, in the case of Katrina, it began even before the levees failed. As a responsible party in several incidents, NOVACES learned the value and effectiveness of the Incident Command System. With multiple iterations, it has become our nation’s best approach to emergency response. NOVACES propose that it can be better.

Without in any way violating ICS protocol or procedure, the NOVACES team has infused CII and PMI process and procedure into what is said to be the worst environmental disaster in US history. In this paper, NOVACES will use this particular response to illustrate the methodology NOVACES describe as Agile Emergency Management (AEM).

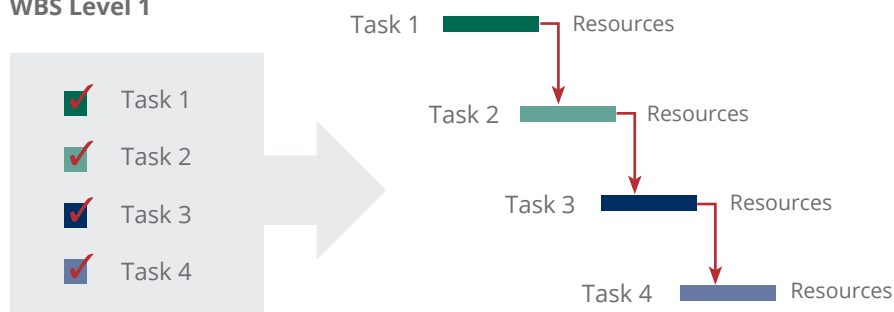
PROJECT MANAGEMENT AS APPLIED IN THE ICS SYSTEM

The elements of an emergency response closely resemble the construction phase of a fast-track design – build project in which engineering is minimally complete and scope is ill-defined. It is in this circumstance that PM principles are most valuable to the parties involved. By utilizing experienced construction planners and planning software, the project manager can bring order to the chaos. Resource-loaded task identification and linkage, management of the supply chain, mobilization of the right resources at the right time, tracking and reporting of task progress and resource productivity, and a broader look at the “big picture” are some of the tools in the project manager’s kit that provide the job clear direction and focus.

In precisely the same way, PM principles applied to an emergency response can bring order to the chaos and provide the responders with clear direction and focus. The first step is to define the task, the resources required and the linkage that task may have to other activities. When you first ask a responder for these details, the answer is invariably “Of course we don’t know everything that needs doing! Why do you think it is called an emergency?” When the forest fire is uncontained, it is improbable that you will get a prediction of the “all clear” signal.

However, the ICS system does, in fact, place the Planning process in the forefront of the response organization. They are tasked with providing Command with their best guess at the response needs over the next planning cycle. That cycle may be a shift, a day, or a week in the early stages of a response. Situation (part of Planning) monitors Operations’ activities and progress during the cycle. The ICS protocol is repeated for each cycle – objectives, strategy, tactics, execution, review and repeat. Resources are mobilized for each cycle based on the objectives, strategy and tactics being employed. None of these activities is foreign to a project manager; the only paradigm shift required for a PM is that each planning cycle may require a different scope of work and percent complete applies only to that cycle’s activities. Each completed cycle becomes a baseline and is replaced with a new cycle plan.

WBS Level 1



AEM converts a static checklist to a dynamic Plan using a standardized WBS and RBS, enabling efficient and effective resource deployment and progress reporting.

The responder may not be able to say how long it will take to deploy containment boom around a marsh island, but he can give a good estimate of how much boom he needs, the number and type of vessels and personnel required, what personal protective equipment his workers must have, what tools they need and when they need them. In other words, he can resource load the overall activity.

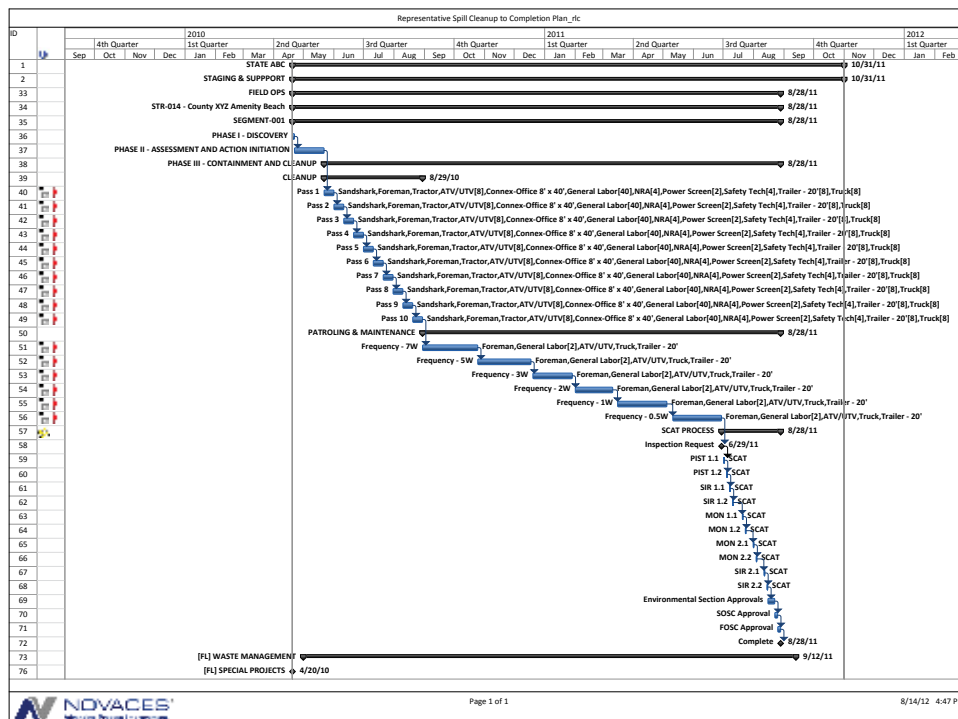
By taking the smallest definable response activity as a project task, the project manager can build the cycle plan in PM software and move the response from a checklist driven set of activities to a dynamic PM software environment. By having the responder define the “bite size” pieces of deploying the boom, the planner can build a project plan for the upcoming cycle activity. If we need fifty workers, we need fifty hard hats, life vests, etc. before they can go to work (supply chain management). Obviously, we don’t need all the boom on day one, but how much is needed each day (team task productivity) and how many vessels, personnel and tools do we need as we mobilize and ramp up to other islands (resource leveling and forecast)? What are the linkages of each task to another (critical path)? What are the logistics and risks involved in performing each task (what if analysis, risk management)? How repeatable are these “bite sized” activities and what are the average and best durations for each (cycle time analysis / key performance indicators)?

FIND OUT MORE

If you would like to learn more about the application of Agile Emergency Management to disaster response, we recommend a Best Practice Briefing.

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This seems like a lot of information to extract from a busy responder on day one of an emergency and it is. The information is best conveyed in the relative calm of an emergency response table-top drill at which all the experts in responding to a particular scenario are available to build a project plan that provides the responders with a mobilization and ramp-up schedule, a resource-loaded task-driven dynamic response tool by which they can gauge progress and productivity within a planning cycle and a forecast tool to scale up or down as the response progresses through each phase. The actual incident may not match the drill scenario but the individual tasks defined in the drill will still apply and, with some modification, the project plan is available for use on day one of the actual response.

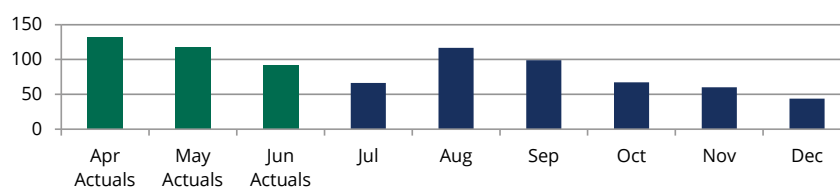
Applying PM principles to the ICS system can be done “on the fly” with difficulty. It requires project-minded individuals in leadership roles in the ICS organizational structure and responders willing to share their knowledge and experience in handling emergencies of all types. It also requires that the use of PM principles improves the responders’ capability to mitigate the consequences of the incident more quickly. CII and PMI have ample proof that these better outcomes are a function of applying their principles to the task at hand.

AGILE EMERGENCY MANAGEMENT BENEFITS

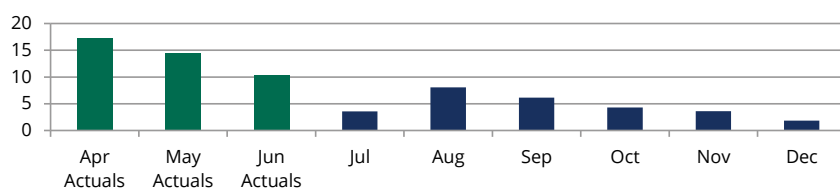
Command Perspective

The ICS system provides a checklist of required activities to plan and execute an emergency response. Some software tools have been developed to automate report generation and data management in larger responses. They do not provide the dynamic planning capabilities of project management software. By applying PM software to the recent oil spill response, Command was given the capability of managing the planning cycle activities in project mode and the ability to forecast longer-term resource needs and completion dates.

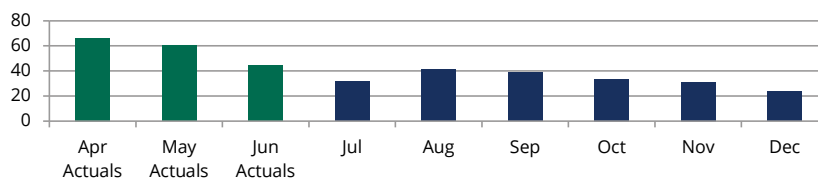
Response Personnel



Response Vessels



Response Equipment



Personnel [or Vessels or Equipment] levels, both historic and forecasted, are aggregated from resource-loaded activity plans and schedules.

Each definable portion of this four-state response was treated as a separate project with shared resources. In this case, the projects were defined as individual shoreline treatment recommendations (STR). Using the STR as a scope document, the planner developed a resource-loaded project plan and tracked productivity against initial “best guess” estimates of duration. Over time, production rates were established for each type of clean-up operation and best practices were shared across the region. The “quality control” arm of the response gauged the effectiveness of each clean-up operation. With a reliable and consistent estimating database and a process to measure progress of the response clean-up, the PM software began providing Command with estimated completion dates for each small project (STR) within the theater of operations and responders were being held accountable for meeting those end dates.

The Incident Management Team in New Orleans became a virtual project management office (PMO) with state branch offices managing their state’s portfolio of projects. Branch project files rolled up to the PMO master file at end of each planning cycle. Command now had a tool to visually gauge progress, monitor resources and productivity, and forecast completions. Command meetings took on the tone of project reviews and decisions were made in PMO fashion – managing the program as a whole with individual project progress tracked and reported for their intervention when needed.

Command finally had a tool that provided them with the “big picture”.

Branch Perspective

Each state, with its own ICS structure reporting to Command, managed its portfolio of projects using PM software to level shared resources, schedule tasks, measure productivity and “what if” review changes to the plan. By using PM principles and software to manage their projects, they were able to level their resource requirements and better manage their supply chains. Forecast activities and requirements allowed for better utilization of their resources and a more effective clean-up response.



Reports to Command were consolidated to project progress reporting with variances from plan and explanations clearly delineated. Special projects were pre-planned and scheduled for optimum resource utilization. As clean-up operations become more routine and predictable, end dates for completion of individual projects (STR) become more certain. Each stage of the project, including final sign-off by the Federal on Scene Commander (FOSC) is included in the project plan with predicted start / end dates for each task.

As each branch team migrated to project mode, the strain of such a prolonged response began to ease. Field and office personnel were now able to step back from “putting out fires” and begin to predictably anticipate their needs.

“Project management can be used to forecast and adjust response resources just as ICS 215, but it can accomplish it more effectively for larger and sustained responses by calculating and compensating for constraints, and capturing more detailed data. Logistics also can benefit from project management, which allows improvements in resource procurement strategies.”

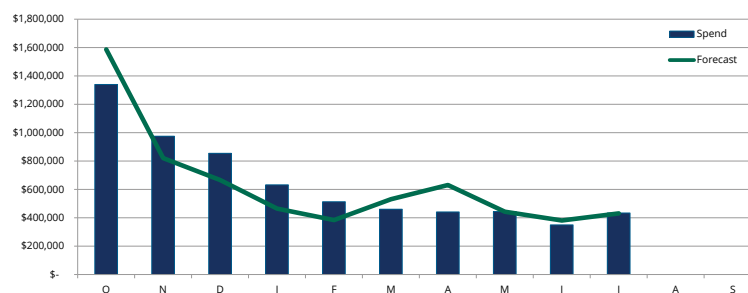
— Chris Michel. ICS and Project Management. IAEM Bulletin April 2012.

Responsible Party Perspective

When the Responsible Party (RP) is identified during a response, the RP becomes part of the ICS structure. As with everyone else on a response, the RP is anxious to end it quickly but with additional incentives for doing so. Besides public image issues, the RP faces potential fines and claims from injured parties as well as the cost of the response itself. The RP bears full fiduciary responsibility for the incident and its consequences. Other entities in a response don't.

Using the PM principles of Agile Emergency Management, the RP reduces the waste of response ramp-up without pre-planning, the uncontrolled use of time and material contracts to execute the response, and the uncertainty of total response costs. When used as the planning tool from table top drill to final FOSC sign-off, AEM provides the RP with a managed response to any emergency – it is the only tool capable of bringing the response to lump sum quality scope definition and cost control.

Spend Variance to Forecast





ABOUT THE AUTHORS



David Bindewald

Dave is a Senior Management Advisor to NOVACES; he has extensive experience in project and program management in the petrochemical industry and holds a BS in mechanical engineering. Dave introduced the application of project control principles to manage the Deepwater Horizon Oil Spill response. As Unified Command of the response recognized the value of this agile approach, the planning process was adapted to this methodology.



Robert Cheney

Rob is a Senior Project Management Consultant with NOVACES; he is a certified Project Management Professional with over 20 years of industry experience and holds a Bachelor's of Science in Mechanical Engineering. Rob served as Project Controls Lead on the 2010 Deepwater Horizon Oil Spill Response and was instrumental in development, testing and roll out of state-of-the-art agile methods used in management of this massive program. He led a team of as many as five schedulers covering four states in development and tracking of over 100,000 resource and cost-loaded tasks. He educated dozens of client and contractor personnel in use of these project management tools, and led overall program budget preparation and tracking.

THE NEXT STEP...

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WHO WE ARE

NOVACES is a management consulting firm that provides performance management, continuous process improvement (CPI), and project management services to both public and private sector organizations. NOVACES helps clients build capabilities in today's most effective methodologies to achieve breakthrough operational and financial results.



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