

FULLY INTEGRATED SCHEDULE FOR A REACTOR DECOMMISSIONING PROJECT

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ABSTRACT

The paper discusses the process of generating a fully integrated schedule for a Reactor Decommissioning Project on an operating site. Discussions include the details of implementation, maintenance and challenges encountered in the establishment of an integrated schedule for a nuclear decommissioning project. The benefits of the process will also be presented.

INTRODUCTION

The scheduling process for many of us is seen to be a cumbersome management tool. However, one should take a step back, look at what a schedule can do for us, and work with the schedule rather than against it.

Those of us who use schedules can be placed into one of three categories; those who truly believe in the process, those who accept the process, and those who treat the process with contempt. Unfortunately in most businesses the majority of us fall into two of the three categories; that is we talk as though we believe, but truly we treat the process with contempt.

What is an integrated schedule? How does it apply to Reactor Decommissioning? It is a management tool that ties Production, Engineering, Licensing and Vendor Control activities together. These ties allow for critical path analysis, logical planning, resource allocation and material identification required to achieve pre defined decommissioning milestones and management of activities in a cost affective manner.

The scheduling process should be of interest to all of us in the nuclear field, particularly those of us involved in the decommissioning arena. With the market being more competitive than ever, we must plan our work and work the plan in the form of agreed schedules in order that we can meet goals and objectives. Putting together a plan will enable the corporation, the project manager, the team leader and participating members of a team see the big picture and how all the project elements fit together.

The discussion that follows is based on the development and implementation of an integrated schedule at an operating nuclear plant undergoing reactor decommissioning on one of its units.

THE PROCESS

June of 1997, the Reactor Decommissioning Unit began to implement the Corporate Twelve Week Work Scheduling process. It soon became apparent that all the needs of a Decommissioning project could not be met using current operating plant criteria. Therefore, the decision was taken to make further steps to improve the scheduling process.

Prior to the development of the integrated schedule, all work was scheduled without regard to other departments within the decommissioning unit, or interaction with the operating plant

activities, this resulted in limited Decommissioning Business Unit Operational support. To complicate matters, there were two major projects underway (Dry Cask Storage and SAFSTOR), with both projects requiring engineering and production, and both having their own separate schedules with critical paths.

Implementing a fully integrated schedule was further complicated by the decision to introduce new software to generate schedules corporate wide. The software used by the Utility is a PC based program called *Project View*, which changed from the mainframe program *Project 2*. Project View (PV) was initially selected by corporate officers to operate alongside a compatible accounting system Cost View, though Cost View was never implemented.

We recognized that a scheduling process developed for reactor decommissioning activities would go far beyond the requirements for an operating unit. That is, producing a level of detail that supports an accounting system that in turn would need to satisfy a State Prudence Audit on the spending of the decommissioning fund. We at the Reactor Decommissioning Unit took the challenge to lead the way and champion the change for the corporate.

Early on in the development process, it became evident that Engineering activities would be the key to success for both Dry Cask Storage and SAFSTOR, and therefore would be the major driver to the schedule. It became important to have design deliverable dates that the Engineering department could meet. The generation of the deliverables and subsequent milestones came about with the break down of each project into detailed activities with logic ties, duration and resource assignments. The Engineering fragnets (fragnet is a "Fragment of a Network", where individual projects or sub-projects are prepared separately, critiqued and refined, and entered into the main network) developed for the decommissioning activities are some of the most comprehensive and detailed products developed within the corporate system.

The development of the Engineering activities became the corner stone of the integrated schedule, and the process that followed. All subsequent projects/activities were developed using a scheduling process which consisted of the breakdown of all identified work scope into fragnetted activities, with the input of these activities into the scheduling software program. A brief guideline as to the process developed for generating the integrated schedule is as follows:

- As new tasks are identified they are placed in a long range planning cycle for review and approval.
- Task scope description developed by a cognizant person.
- Order of magnitude estimates are prepared, along with an initial Level I schedule, establishing the task proposed start and finished date within the integrated schedule.
- Tasks are packaged and presented to the senior management for their review and approval
- Preliminary Level II schedules are developed, and resource loaded.

- Development of cash flow and budgets
- Development of detailed Level III & IV fragnets.
- Production of the integrated schedule.
- Implementation of the Reactor Decommissioning schedule into the operating stations scheduling process.

With the schedule now fully integrated regular meetings are held with Production and Engineering. In addition, Area Planners work with the cognizant Engineer and/or Field Coordinator to update the system. Generation of products includes but is not limited to level one, two, three and four plots, logic diagrams, Gantt charts, and resource histograms.

Various challenges were experienced in the transition, all of which were resolved successfully with the dedication of a closely-knit team. They were as follows:

- A significant challenge was the implementation of the integrated schedule at the same time as converting to a new and untried scheduling system. Numerous technical difficulties in both Project View and the Granada graphics program were experienced.
- Initially Engineering and Production fragnets were developed independently of each other, creating a host of inconsistencies between the scopes of the Production and the Engineering fragnets. This led to mis-matches between the fragnets (good lessons learned).
- Early detailed Production fragnets were developed prior to the full scope of the project being identified by Engineering (as opposed to using a single conceptual activity to represent production work). This led to fragnet revisions and in some instances completely re-building or removing the original production fragnet. This impact was limited due to early recognition of a required implementation process modification.
- Acceptance of the integrated Engineering and Production schedule was an initial challenge. There were several situations early in the project where individuals tried to circumvent the system, and "cut deals" to get work available to them sooner. This led to rework in the schedule and confusion throughout the organization.

The solution was strict enforcement of existing processes, procedures, and implementation of an integrated planning/status meeting, together with communication of management expectations to the project team.

- To assist in defining the scope of the Production portion of the schedule, an interface with the company's maintenance system was developed. For this a set of tools were developed that helped schedule Out-Of-Services (the process of tagging to create a

zone of protection), Post Maintenance Testing and routine preventive maintenance items.

- Project View has a notably inferior graphic generator and creates an unnecessary burden on the team in terms providing our customers with a quality product.
- When the project implemented Graneda as the graphics generator the client had requested several enhancements to the software that were being implemented, as the software was being deployed to the sites. This led to several technical issues that kept the team from using the software for extended periods of time.

The graphic issues were resolved by taking the aggressive step of employing the services of the Graneda representative directly by the project. The representative came to the project site and re-installed the software from scratch (after the enhancements were all in place), checked for functionality to the satisfaction of the project team prior to their services being released. It should be noted that this aggressive step also assisted the Corporate PV Implementation Team in accelerating their initiative in bring the new scheduling system on stream.

- Difficulties were experienced in obtaining outputs from Graneda in the format the team required, this was due to a lack of familiarity with the software, together with a lack of available training.

The difficulties were resolved with the assistance of the Graneda representative directly to the project.

- Project View Job Server Technical Issues. One of the advantages of using ProjectView as a scheduling tool is that it has a "job server" that allows the user to run jobs remotely rather than tying-up scheduler's computers. However, the availability of this server had been a problem. A software glitch caused the server to crash when excessive operators were logged into the server.

This was resolved with a close working relationship with one of the Clients Corporate PV Implementation Team.

- Transitioning to the "new" 32-bit version of Graneda with enhancements: To deal with the possibility that the software would not function correctly, the project team insisted that participation in the "beta" testing period, to test the software for flaws. Several flaws (15 to 20) were identified, and corrected.

BENEFITS OF THE PROCESS

The primary benefit to the process is that all departments and workgroups are able to have their own schedules generated out of a common database.

The Decommissioning Unit can now interact with the Operating Units at a scheduling and planning level.

A vast improvement to the Reactor Decommissioning Teams schedule adherence.

Team work and moral improved as result of friendly competition to gain a higher percentage of schedule adherence between departments within the Reactor Decommissioning Unit.

Additional benefits include, all departments are now working to and from the plan and priorities.

It represents the total organization commitment to a plan, with a project management tool used to establish and measure performance.

CONCLUSIONS

The Decommissioning Team has effectively put together a process in the integrated schedule that no other corporate organization has accomplished to date. And that is, integrating the Engineering, Production and On-line Maintenance activities into a single scheduling system.

The management of a large dynamic project such as decommissioning requires a scheduling tool that can give immediate feed back to all planning changes and emergent issues. The integrated system developed provides that feed back and allows management to evaluate the impact of all schedule deviations. In addition, situations where choices between budget and schedule are required, different scenarios can be run to provide management with the information needed to make the best decision for the project.

Plan work and work the plan in the form of agreed schedules in order that goals and objectives can be met.