Submittal for the
1998 Project Management Institute
Project of the Year

Year 2000 Project
for the
Hanford PHMC

Submitted by:
U.S. Department of Energy
Richland Operations Office

and

Fluor Daniel Hanford

Submitted to the:
Tri-Cities/Columbia Basin Chapter of the
Project Management Institute (PMI)

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<tr>
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H. Author/Requestor

Kelly Layfield

Maasha Bell

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I. Reviewers

- [x] General Counsel
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I. General Information and Project Team

Name and location of the project:

Year 2000 Project for the Project Management Hanford Contract (PHMC)
Year 2000 Project Office, Hanford Site
Richland, WA 99352

Name of the owner supporting the project team:

U.S. Department of Energy, Richland Operations Office (RL)

Name and addresses of the project team member businesses:

U.S. Department of Energy, Richland Operations Office (RL)
Attention: Andy Wirkkala
P.O. Box 550 MSIN A5-11
Richland, WA 99352

Fluor Daniel Hanford (FDH)
Attention: Robert E. Gates and Marsha Bell
P.O. Box 1000 MSIN G1-21 and H8-41
Richland, WA 99352

The RL Site Infrastructure Division had overall responsibility to ensure the Hanford Site identified, dispositioned and managed all Year 2000 (Y2K) date related issues. An RL Project Manager coordinated these activities with all affected RL divisions and provided oversight for all Year 2000 activities for the Hanford Site, which included the PHMC, Pacific Northwest National Laboratory (PNNL), Bechtel Hanford, Inc. (BHI), and the Hanford Environment Health Foundation (HEHF).

The formation of the PHMC Y2K Project was an extreme challenge, and for the following reasons took many months to assimilate: 1) the nature of the Y2K problem was unprecedented and had world-wide implications, 2) defining the scope and devise a strategy appropriate for the Hanford environment, 3) developing an integrated, multi-contractor organizational structure; 4) working with a new DOE contract structure, the PHMC comprising thirteen companies rather than two companies of the previous contract; and 5) evolving guidance from the Office of Management and Budget (OMB) and DOE HQ.

FDH, as the PHMC prime, was responsible for Y2K activities of all six major subcontractors and associated subcontractors. FDH carried out these responsibilities through a Year 2000 Project Office managed by a Project Director and Project Manager. The Year 2000 Project Office established the overall guidance and approach, directed the implementation, execution and control of the plan, maintained the PHMC team performance measurement baseline, performed compliance
assurance reviews and kept essential, due diligence documentation. FDH maintained
the primary interface with RL, relating guidance and direction accordingly to the
major subcontractors. The Year 2000 Project Office worked within the management
structure of the PHMC organization to communicate and provide guidance, however
the primary relationships established to accomplish the Year 2000 work was through
six major subcontractors and seven subcontractor company designated Y2K Points of
Contact (POC).

PHMC Year 2000 Project Organization

Each major subcontractor had the responsibility to conduct their company specific
activities in accordance with the PHMC Y2K plan, and work with their respective
FDH Directors and RL counterparts to implement that direction. FDH Project
Directors for site projects were responsible to direct the major subcontractors toward
the successful completion of Year 2000 activities. Accomplishing this involved
overall direction and authorization of Year 2000 work scope and funding, risk
classification and to monitor progress against PAs and milestones.

Specifically, the major subcontractors were responsible for: the inventory and self-
identification of Y2K impacts, prioritizing impacts and assigning risk, developing
schedules, acquiring the budget and resources, providing monthly schedule,
performance and cost status, providing appropriate documentation and participating
in compliance assurance reviews. In addition, each company was required to identify
a dedicated Y2K POC to be the primary focal point for these company specific
requirements. In some cases the Y2K POCs were identified as Project Managers and
managed in that capacity.
II. Project Performance

A. Project Summary

This project evolved from the technical understanding that computers may or may not be able to transition into or function properly when the century changes to the year 2000 and the sudden awareness of the widespread potential impact. This realization took on a formal emphasis at the Hanford Site in 1996. It took approximately a year and a half to assimilate and understand the problem and to develop and implement the approach in an effective operating management framework. Described next are some of the complexities, unusual conditions, issues and barriers faced by the project team.

Management Structure, Awareness and Ownership. The magnitude of the year 2000 problem and the required resource commitment was not understood in the beginning. In most cases year 2000 fixes would be transparent to the impacted company, and they could see no benefit to the time and resources required. Management awareness was essential to mobilizing the efforts necessary to ensure that business continuity was not impacted.

As project work commenced, ownership issues surfaced that were the result of the contract structure change - it was not clear who owned the Y2K inventory items that had been identified. This issue took a significant amount of time and resources and had to be addressed before any further work could be conducted. In order to resolve the problem, a company policy was established directed at this particular situation. At the same time FDH requested all subcontractors to migrate off of site-wide systems causing the subcontractors to seek new system implementations at the same time they resolved Year 2000 issues related to the PHMC.

Technical and Operational Complexity. The large quantity, variety of platforms, diversity of components, and number of interfaces involved in this project increased the technical complexity significantly. After the initial inventory was completed, the project scope was established at 217 Y2K projects representing 256 applications, 2,543 equipment components, and 10,986 infrastructure components defined as follows: applications - commonly called software or systems; equipment - with embedded chips (i.e., instruments, process control systems, monitors, surveillance, elevators, HVAC, etc.); and infrastructure - the basic computer hardware and associated software systems that support the Hanford site (i.e., local area network, file servers, desktop software, micro/mainframe hardware, telephone system, etc).

In many cases, planning and scheduling these items required the effective coordination of hardware, software, operating system and database components and equipment. For example, when multiple systems shared the same hardware platform, Y2K changes had to be coordinated so all components could be implemented simultaneously. Interfaces between systems also complicated the effort, as did the multiple system integration upgrades and migrations off site-wide systems (deactivations). These complexities required disciplined configuration management to ensure stable system implementation.
Identifying and resolving year 2000 date problems takes into consideration more than one date and also the use of dates before or after that date. Understanding these nuances was important as year 2000 work was performed and reviewed. The project established compliance guidance that took into account all conceivable variations stating that neither performance nor functionality is to be affected by dates before, during, or between the 20th and 21st centuries (19XX and 20XX), and after the year 2000. In order to ensure this occurs, the requirements were established: Rule 1. No value for current date will generate erroneous information or cause any interruption in normal business operation; Rule 2. Date based functionality must behave consistently for dates prior to, during and after the Year 2000; Rule 3. In all interfaces and data storage, the century in any date must be specified explicitly, by unambiguous algorithms or implicitly inferred rules; Rule 4. Year 2000 must be recognized as a leap year.

An example of a date that could cause problems before 1/1/00 will happen with global position system units. On 8/21/99 the units will rollover their week counters from 1,024 back to 0 causing potential inaccurate position reporting. Another example is fiscal year rollovers prior to 2000 (e.g., fiscal year 2000 starts on 10/1/99). There are other dates, such as 9/9/99, that in programming functions can indicate the last record rather than a date and also, the year 2000 is an unusual leap year because it doesn't follow the typical rules for determining leap years.

**Time Frame.** At the time the project scope was identified, there remained 479 working days until January 1, 2000 - an unmovable milestone. The work scope could not be clearly known until the assessments were completed. Work had to be completed before January 1, 2000 because of programming issues with earlier related dates. This time frame was extremely short considering the sheer magnitude and technical complexity (global, multiple languages, etc.) of the Y2K problems and the effort necessary to plan and coordinate resolutions.

**Age and Experience:** The Hanford site maintained several long-standing, custom legacy systems. This posed difficulties with identifying and fixing Y2K problems because original vendors and those responsible for original system design were either no longer in business or no longer working for the Hanford site. Without this prior knowledge, the ability to understand the system design and specialized tailoring reduced the ability to streamline remediation efforts complicated the process and stretched schedules.

**Enterprise Resource Planning Initiative (Handi 2000).** A decision was made to implement an integrated system, Handi 2000, at the same time as Y2K activities. This initiative replaced a number of candidate Y2K projects, which if not completed before Y2K problems occurred would have posed additional risks and complications.

**Project Visibility.** The Y2K date problem was not just a Hanford site related subject. Y2K issues permeate computer systems and equipment around the world. Within the government arena, resolving Y2K problems and ensuring business continuity was of
extreme importance and received visibility upward through DOE HQ, to OMB and to the President of the United States. As defined in 36 CFR 1236.14, "the technological emergency eminent in the Year 2000 dilemma qualifies it as a potential national emergency that can seriously degrade or threaten the national security of the United States." Thus, if the Year 2000 problem was not addressed in a proactive manner, the impact to the Federal Government, the public and the American economy could be devastating. On February 4, 1998 Executive Order 13073 established "The President's Council on Year 2000 Conversion" (http://www.y2k.gov) which is responsible for coordinating the Federal Government's efforts to address the Year 2000 problem. The Council is made up of representatives from more than 30 major Federal executive and regulatory agencies. The decisions made by the PHMC team adequately addressed, prioritized and resolved their Y2K problems, which became even more important as they related to the overall status of government Y2K problems.

**Legal Issues.** Potential litigation with Y2K problems keyed to negligence and injuries was a continuing concern for companies, vendors, individuals and company officers. The resulting effect was the determination of vendors and related others to be protective and not divulge status and or Y2K compliance information. Many of the PHMC Y2K projects were affected by this situation because the lack of information required additional testing, procurement and time. The federal government helped ease this information log jam by signing into law the "Y2K Information and Readiness Disclosure Act" which encouraged companies and governments to share Y2K-related information while offering limited-liability protection. From the project standpoint, this resulted in all status formation captioned with a 'Y2K Readiness Disclosure' statement.

**B. Special Management Methods**

The PHMC Y2K Project developed a disciplined process and solid methodology for performance, which withstood the scrutiny of various reviews and evolving guidance. The key deliverables of the PHMC team were to complete impact identification, assessment, renovation, validation and implementation of mission essential projects culminating in a compliance assurance review, on a schedule that met the DOE-RL Performance Agreement (RL PA) and DOE HQ milestones. The PHMC Year 2000 Project implemented a six-phase process. Each phase was further subdivided by application, equipment or infrastructure and by project disposition (repair, replace, indicated compliant, deactivate, contingency plan) which determined the deliverables, reporting dates, documentation and the acceptance criteria for performance completion. The phases are described here:

**Phase 1 - Impact Identification** - The phase during which applications, equipment and infrastructure computer items are inventoried, ownership defined, mission essential status determined, risks ranked, renovation disposition, and the compliance status indicated.

**Phase 2 - Assessment** - The phase during which planning, analysis and testing are performed, external and internal interface impacts determined, alternative solutions specified and solutions and/or contingency plans determined.
Phase 3 - Renovation - The phase where test plan is prepared and the repair, replacement, or deactivation to achieve compliance is performed.

Phase 4 - Validation - The phase where testing is performed, test results validated and variances, as a control measure, are reviewed. Each test plan is run completely and successfully, the resultant documentation available for review, and compliance certified.

Phase 5 - Implementation - The phase where a renovated Year 2000 project is migrated into production. This phase may result in new issues requiring resolution. Implementation involves user training and documentation updates as needed.

Phase 6 - Compliance Assurance - The phase where the Year 2000 Project Office reviews mission essential compliant systems. This review will verify that appropriate documentation exists and that due diligence was used to achieve compliance. Reviews will be conducted using a graded approach.

Year 2000 Project Approach

Project success was dependent upon the PHMC team and RL taking proper ownership, sponsorship and responsibility for Y2K activities. An extensive communications and awareness effort took place to encourage these attitudes about the potential problems and the steps necessary to complete the activities on time and with confidence.

The project developed a Y2K database to store and report data gathered throughout all phases of the project. Through the use of this database, project requirements and management decisions were incorporated into the system through a series of edits and a track record maintained. The large scope and complexity of the project necessitated a way to capture data, use the information for analysis and real time reporting. The database was further expanded to a webpage application (see attached) allowing
project status information to be input by the Y2K POCs, which in turn generated immediate changes to online reports. This statusing information proved invaluable as the project moved into critical phases and toward milestone completion. Use of a database and webpage in this manner for Y2K activities was unique to DOE contractors.

To facilitate the project's ability to handle the changes in a timely and effective manner, the PHMC Y2K Project Manager became a participant in the Energy Facility Contracts Group (EFCOG) Year 2000 Working Group. As a member of this group, the PHMC Y2K Project Manager became involved in drafting responses to guidance thereby influencing ultimate DOE HQ decisions and in leading initial Y2K business continuity guidance.

C. Owner Satisfaction

RL pays contractors through the completion of scope as defined in PAs. The PA may also incentivize or penalize based upon cost and schedule performance. The FY 1998 Y2K Project performance expectations were included into a FY 1998 PA along with the Handi2000 Project. The FY 1998 PHMC Y2K PA component was met as well as the stretch goal. So much additional scope was accomplished and completed under budget that the customer singled out this project alone in 1998 to receive payment although the other work components of the PA put the entire PA in an overrun condition. (see attached).

FY 1998 Y2K Project Performance Agreement Final Status

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
<th>Performance Expectation</th>
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<th>Actuals</th>
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<td>Equipment</td>
<td>100%</td>
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<td>9/30/98</td>
<td>Applications</td>
<td>80%</td>
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<td>30%</td>
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FY 1999 Y2K Project Performance Agreement

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<td>DOE HQ Reported</td>
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</tr>
<tr>
<td>All Reported</td>
<td>100%</td>
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</table>

1999 Performance Expectation Plan (stretch goal): Implementation and Compliance Assurance for all reported to be 100% as of 3/31/99.

III. Project Scope Management

Scope Initiation

The project goal was to ensure that necessary computer systems and equipment were Year 2000 Ready and that critical dates passed without occurrence. To meet this goal, every computer item was evaluated for Year 2000 compliance and impacts prioritized, compliance activities were documented and authenticated for field audits and legal accountability, progress was statused, and DOE HQ milestone requirements and RL PAs were met.

A Y2K Project Management Plan (PMP) was developed after completion of an initial Y2K study that provided the preliminary scope of the problem and rough order magnitude cost. The PMP described the purpose, background, justification and issues connected with the project and established the approach, workscope, project organization and costs. The PHMC Year 2000 Handbook, Volumes 1-4 (Handbook, Status Reporting, Compliance Assurance and Contingency Plan) set forth the guidelines and requirements for project execution.

Authorization

Authorization for Year 2000 activities began in 1996 when RL initially directed FDH to prepare a PHMC Year 2000 Project Report and provided funding. Following the report, RL directed FDH to provide a detailed Year 2000 project plan to cover the remainder of FY 1997 and requested a baseline change control to support the effort. The baseline change request supported the establishment of the Y2K Project Office. Y2K activities for each company were engaged shortly thereafter under the management of the PHMC Year 2000 Project Management Plan and subsequent guidelines. Budgets and funding for company specific Y2K activities were authorized through the appropriate procedures.
Scope Planning

Information technology is an integral part of the Hanford site mission essential activities, including desktop computers and software, embedded chips in process control equipment used in the facilities and tank farms, the local area network and telecommunications, and hundreds of applications some with complex interfaces. The first phase of the project produced the scope of the project through an inventory and discernment process. After the initial inventory, the magnitude of the problem was further delineated by assessing the impact of non-compliance to the Hanford mission designating items into either mission-essential or non-mission essential categories. Mission essential was defined as systems, equipment items, or components with date information requiring Year 2000 compliance whose failure may result in 1) injury to personnel, 2) damage to property (public or private) or 3) delays in the performance of a mission activity.

Scope Definition

Completion of the first project phase identified the scope of the overall PHMC Y2K Project by specifying the individual mission essential projects that would be managed using the Y2K Project WBS structure, phased approach, deliverables and milestones. The scope of the PHMC Y2K Project encompassed 217 Y2K projects representing 256 applications, 2,543 equipment components, and 10,986 infrastructure components. Status for 23 of the 217 projects was reported to DOE HQ & OMB.

| DOE-RL Projects | 23 |
| PHMC Projects   | 194 |
| • FDH           | 90 |
| • WMH           | 18 |
| • DESH          | 9  |
| • NHC           | 6  |
| • LMHC          | 26 |
| • BWHC          | 27 |
| • DynCorp       | 18 |

Scope Change Control

Project scope was managed from two perspectives. The first involved control of the inventory, the 217 Y2K projects and the specified Y2K disposition for each project. Changes to any of these factors required both FDH and RL review and concurrence. The second involved the management of evolving guidance. Because of the uniqueness of the Y2K Project and the fact that it had never happened before, everyone was learning in parallel and project requirements and completion specifications were initially unknown. At the time the Y2K Project was authorized, very little direction had been received from HQ or OMB. Overtime however, these agencies became more engaged with Y2K issues and developed strategies which...
resulted in modified milestones and deliverables. RL played a significant role in determining how to pass on the guidance to the field with as little impact on the project as possible. This occurred with the active participation of the Y2K Project Office helping RL to understand the impacts of decisions and in some cases develop the implementation strategy. As these scope changes occurred, the control aspects remained consistent with the WBS and were based upon the technical scope baseline, schedule and cost estimates. Through the effective coordination between RL and the project, all changes were implemented and accomplished within the original cost estimate and finished either ahead of or on schedule.

Scope Verification

A formalized review and validation process was developed to support the fiscal year PAs established between RL and FDH. The process identified steps necessary for phase completion and the project review and validation process. For each phase of the project the activities that constituted acceptable completion of the required status activities were determined. These completion and acceptance (see attached) specifications were documented via letter from FDH to RL and incorporated into the appropriate PHMC Year 2000 Handbook for implementation. A checklist was used by RL to perform the assessment and renovation validation (see attached).

**Project Review and Validation Process**

*Represents the activities and responsibilities leading to RL concurrence on completion of a Y2K project phase*
IV. Project Time/Schedule Management

"Schedule creep" had a whole new definition for the Y2K Project. As presented in the timeline, the completion date moved up 10 months from the original schedule.

<table>
<thead>
<tr>
<th>Date schedule completion requested</th>
<th>12-98 DOE HQ</th>
<th>10-98 FY '98 PEP</th>
<th>1-98 FY '99 PA</th>
<th>1-97 PMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completion date to be met</td>
<td>1-99</td>
<td>3-99</td>
<td>7-99</td>
<td>11-99</td>
</tr>
</tbody>
</table>

The Y2K Project Office used Primavera Project Planner to schedule, measure and report performance of their responsibilities to ensure the PHMC Y2K Project milestones were completed. The respective project owner generated schedules for each of the 217 Y2K projects. These schedules were separate and not integrated and although projects varied in complexity and dependencies levels, all schedules were managed according to the milestones and deliverables directed by the overall Y2K Project WBS.

Because the schedules were not integrated, a significant amount of effort went into determining the best method to gather and report individual and roll up status for the entire PHMC. The Y2K database was selected for this purpose resulting in the phase completion dates being incorporated and a process developed to input status and generate reports. As information was updated and revised, the database allowed for immediate feedback and statusing at all levels of the projects (i.e., project, company, responsible organization, overall, etc.). After several months in this mode, which required all input to be performed by the Y2K Project Office, the process was simplified by expanding to a webpage application. Project status information was then input by the Y2K POCs greatly decreasing turn around time and facilitating roll-up reporting at the PHMC site level (see attached).

This process for statusing individual project information proved invaluable as the project moved into critical phases and toward milestone completion. Comprehensive status information in this format became an instrumental tracking and analysis tool to mitigate risk of missing key milestones. Visibility at this level and subsequent timeliness helped to identify projects 'at risk' and to expedite project needs to meet schedules and milestones. It also became useful in identifying projects whose schedules could be accelerated in order to meet stretch goals presented by both RL and DOE HQ.

The Office of Management and Budget (OMB) and DOE HQ established the scope guidance and milestone requirements for mission essential projects, which applied to 23 of the 217 PHMC Year 2000 Projects. RL adopted the same guidance and applied
it to the remaining 194 projects, subsequently establishing performance expectations through the PA process.

V. Project Cost/Resource Management

It became apparent to RL that a formal work effort needed to be established to address the Y2K problem because Y2K activities had not been included in any multi-year work plans (the work scope authorizing process). Therefore the process to get the work scope and associated budgets identified, requested and approved was arduous, and at times iterative, because of the changing requirements and milestones. The first portion of the project to be authorized for funding was the Y2K Project Office. Completion of the project inventory phase resulted in the total estimated cost for the entire project, $26 million, and the identification of the 217 Y2K projects and owners. At this point, baseline changes were pursued and schedules and time phased budgets established for the individual projects.

Each project managed their budgets measuring cost and progress (earned value) against the plan. Progress against the plan for the PHMC Y2K Project (Y2K Project Office and 217 Y2K projects) was monitored against the fiscal year Y2K PAs in terms of the accomplishment of specific expectations and against the cost baseline.

The original work plan and baselines for this project were impacted as a result of evolving requirements, milestones and deliverables from OMB and DOE HQ. Through the effective stewardship by RL, the Y2K Project Office and Y2K POCs, achievable work strategies were developed to address the impacts. All projects were able to incorporate the impacts, meet new schedule requirements and support additional documentation and deliverables. There was no change in the project total estimated cost and the project either met or exceeded schedule accelerations and increased performance expectations.

Project management was extremely sensitive to the fact that this work was unique and it had never been done before. They therefore anticipated a changing environment and became intimately involved in all aspects of the process and thereby maintained an approach that withstood high level visibility and associated scrutiny. Public concerns over the ability of the government, and others, to ensure that Y2K impacts would not occur resulted in increasing oversight by OMB and HQ and eventually resulted in schedule/milestone acceleration. Not only was the team challenged to accelerate schedules, but also to respond to guidance that required additional documentation of existing sound business processes. The Y2K Project met all milestones and completed the requirements of all deliverables within the original cost baseline.

During the course of the project the Y2K Project Office became aware that the established compliance assurance review process could impact the projects' ability to meet accelerated schedule guidance. In addition, they had discovered that many of the completion criteria documentation problems were not being discovered until the
project was completed causing rework and some schedule slippage. The process was revised so that reviews were conducted at the start of each phase and documentation collected during the phase. This reduced the time required to complete the review, eliminated rework by the projects, prevented a bottleneck at the end of the schedule, and also resulted in the need for fewer staff than planned for the Y2K Project Office.

V. Project Quality Management

The Y2K Project team instituted quality planning throughout the process, developed guidelines and acceptance criteria, and monitored progress as outlined in the Y2K Handbook, Volumes 1-4. Compliance assurance was incorporated into the work plan and tasks designated within each phase of the WBS. Toward the end of the schedule DOE HQ issued independent verification and validation (IV&V) and end-to-end testing requirements. The IV&V guidelines were based on the IEEE 1012 standard. The purpose of this guidance was to further reduce the risk of system failure due to Y2K problems and to improve the confidence level in selected the Y2K solutions before actual Y2K events occur.

To meet the IV&V guidance RL arranged for an external, independent organization to determine the sufficiency and completeness of testing and to identify corrective actions to ensure Y2K compliance. This confirmation process will be performed by April 1999 on all the DOE HQ reported systems and several other selected high priority systems. To meet the end-to-end testing requirements, key business processes and the supporting applications were identified and evaluated to determine if existing tests performed were adequate. This included tracking the interfaces between applications to ensure the intent of end-to-end testing was met.

The goal of the project compliance assurance was to ensure that all mission essential Y2K projects were compliant and that supporting documentation was complete and
accurate. Compliance assurance was conducted using a graded approach - the higher the risk, the more comprehensive the compliance assurance requirements to prove compliance and limit risk. Status reporting guidelines delineated the acceptance criteria and support documentation for project phase completion that then supported the compliance assurance review process. The Y2K Project Office maintained all quality documentation for the project.

Project performance metrics (below and attached) were reported on a bi-weekly basis and covered scope, cost, schedule, progress against the PA, compliance assurance, awareness and safety. A colored 'stop light' status chart (see attached) was developed to highlight problem areas by specific colors - red dates quickly identifying project phases that were behind, green signifying on schedule and blue showing project phase completion. The continuous monitoring of project results against the quality requirements provided project management with visibility of unsatisfactory performance and allowed for timely changes in either strategy, process or individual project issues.

In addition to established internal reviews at varying levels and with RL, the project was subjected to numerous external reviews - Defense Nuclear Facility Safety Board (DNFSB), Inspector General (IG), DOE HQ (HR- Chief Information Office and EH - Office of Inspections), Hanford Advisory Board, and corporate offices of FDH and the major subcontractors.
VI. Project Human Resource Management

Since there was very little industry experience with handling Y2K data problems, as understanding increased, the management and WBS structures for the project were revised accordingly. The underlying philosophy remained constant (phased approach), but the conduct of roles and responsibilities, both within the project office, and for the subcontractors were refined, broadened and increased.

Two changes occurred that advanced the project into a more effective team. Initially FDH contracted with Lockheed Martin Services, Inc. (LMSI), a subcontractor to the PHMC contract with responsibilities for information resource management for the PHMC, to carry out the Project Manager function and manage the Y2K Project Office. It became clear as the project activities got underway, that the subcontractors did not recognize LMSI in that lead role. As such, the alliances and teaming necessary to accomplish the objectives of the project were falling behind the tasks requiring their involvement and ownership.

The other change was to move the role of Project Director from the FDH Chief Information Office (CIO) to FDH Project Control and to assign an individual intimately involved with Hanford processes and with an effective relationship with senior management. These changes brought into existence more direct communications allowing guidance and direction for Y2K to be addressed at the appropriate levels within both FDH and ultimately the subcontractors. A lot of time was spent explaining the process and approach, presenting the path forward and the steps necessary to accomplish the schedule and milestones and the associated responsibilities.

As senior management became engaged, the working relationship between the Y2K Project Office and the subcontractor Y2K POCs opened up. The timing of this change could not have been more advantageous. During this time frame, the project was in the Impact Identification Phase that disclosed ownership issues, which had not yet been addressed since the Hanford contract was awarded to a new management team in October 1996. Working through the convoluted and complex ownership issues was unplanned and turned out to be a time consuming effort. Ownership issues also challenged work process definitions and management responsibilities. Working through these from a Y2K perspective resulted, however, in helping the PHMC work through other similar situations, resulting in clarified roles and allowing the PHMC to tighten its management of the contract.

Trust began to grow, and even though numerous direction changes resulted in, at times, strategic debates, the team did not waver and the focus remained clear. The Y2K Project Office was able to perform the role as process facilitator but also as a trusted support organization that truly helped Y2K projects to reach compliance and work through, not only technical problems, but also management and strategic
uncertainties. Continuance of a multi-faceted awareness and communications campaign maintained this continuity and made new barriers easier to breakdown.

What proved to be invaluable for project accomplishments was the relationship developed with the RL Y2K Project Manager. FDH senior management and Y2K Project Director allowed the Y2K Project Manager the latitude for frequent, timely and open communications with RL. The stage set by the Y2K Project Manager was one of honesty and sharing because the project environment demanded it - Y2K issues were new, OMB and HQ continually redirected and expanded scope, there were numerous external reviews and scrutiny, and others. This required a decision making and communication process that could deal promptly and effectively with it in order to be successful. Openness on the part of the PHMC was reciprocated by RL building upon the team that ultimately felt no corporate or contractual boundaries to complete the project. RL was present at the bi-weekly Y2K Point of Contact meetings and the interactions in that forum resulted in open dialogues at the working level. RL had a clearer understanding of the true impacts of decisions and a closer involvement with the issues and also with celebration of the accomplishments. RL provided an effective role in filtering HQ guidance; however, RL kept the project aware of approaching issues which gave management time to consider the impacts and thereby helping RL to respond more quickly and precisely when draft guidance was issued.

Corporate backing by Fluor Daniel, Inc. (FDI), and ultimately the other subcontractor corporate offices, played an effective initial role in understanding the impacts of Y2K and getting FDH management on board. Once it was clear the project was well under way and on the right track, FDI maintained a vigilance on progress and was able to support problems when they arose as did the subcontractor corporate offices.

Another factor that contributed to an effective team was constancy of personnel. The originally selected Y2K Points of Contact remained the same throughout the project. The Y2K Project Office was made up of individuals from FDH, FDNW, LMSI and several outside contractors. It was able to maintain a core group of individuals although it experienced a fair amount of change in both the size and make up of its team. Individual, project and company accomplishments and successes were recognized and celebrated in group settings and it was evident that each member felt part of that achievement.

VI. Project Communications Management

The nature of the project in the Hanford environment demanded effective and comprehensive communication and awareness campaign that targeted internal and external stakeholders, and PHMC management and employees. Stakeholders included the Office of Management and Budget (OMB), DOE HQ, DOE RL, and Fluor Daniel, Inc (FDI) and various agencies within Washington State.

Communications with each of these groups was crucial for several reasons. First, the unfamiliar characteristics of the project and its relationship to the Hanford mission.
Second, the extensive lack of understanding of the potential impacts as they related to not only the Hanford site but also to the world. The Year 2000 date problem was not a familiar concept and yet it had the potential to touch every individual on Site at work and at home. Initial reactions to resolving the problem were simplistic by most, not only with management but also with the technical community. As such, the project required the use of multiple, and repetitive methods to communicate and respond to varying need levels. For example, most employees wanted to know whether their office PC would work. Management needed to first understand the problem, become familiar with the approach in order to make appropriate decisions, and then be apprised of project status and issues. Those involved with implementation required technical training and awareness as well as an understanding of the process and approach they would be working with. External agencies required process and result verification and validation documentation as well as progress status. The intent of the communications was to address these needs, instigate involvement and participation, instill confidence and reassurance, build partnerships toward a common goal, educate and maintain current information.

A broad methodology was used to reach these objectives and the needs of the targeted audiences requiring the use of extensive communication methods. The methods used included: presentations, project team meetings, training by the Y2K Project Office, internal and external WebPages, Hanford site and community newspaper articles, Hanford PROGRESS publication (special edition of the site newspaper), traveling exhibits, PHMC Y2K Quick Reference Guide pamphlet (see attached), continuous process improvement topics for meetings, bulletin boards, local Y2K Expo presentations, participating in the DOE complex EFCOG Y2K group, quarterly communication effectiveness surveys, the PHMC Y2K Project Handbook, Volumes 1-4, Y2K/Handi2000 Transition Center (a center where employees could get information on the Y2K Project), and a Y2K desktop support hotline. In addition to these project originated communication activities, formal monthly and quarterly reports were submitted to FDH, RL, HQ and OMB as required along with updates the HQ Y2K Mission Essential Database.

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**PHMC Year 2000 "Just in Time" Training**

![Graph showing the number of employees trained over time](chart.png)

- **Total 301**
- **Training Conducted:**
  - Overview
  - Equipment Infrastructure
  - Testing/Validation
  - Contingency Plan

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Due to the potential high risk associated with the work the bi-weekly Y2K Points of Contact meetings with representatives from each contractor, RL and the project office proved to be the most effective communications forum. The meetings were helpful in integrating experiences, lessons learned, and solution sharing across the contractors and for maintaining a comprehensive understanding and involvement in all project issues. During these meetings members were kept current with guidance and involved in providing feedback. As critical milestones approached, 'at risk' project status was reviewed and many times a workable solution was generated from the group.

### VII. Project Risk Management

Several project documents addressed the risks associated with the project. The project management plan addressed the overall risks associated with the baseline scope (i.e., management awareness, time frame, technical complexity, size of effort and multiple contractors, multiple upgrade and replacement efforts, etc.). Other risks such as that associated with determining which projects were mission essential was managed through the risk criteria and use of a ranking methodology. This allowed system and equipment owners to appropriately identify the most critical projects and prioritize the work accordingly so that the most important would be completed first.

A risk associated with completed projects is that there was not a standard procedure to use for all the projects. Reporting dates, documentation and acceptance criteria were based on the selected renovation disposition (repair, replace, indicated compliant, deactivate, contingency plan) selected by the project. To ensure projects had completed appropriately, the project established a compliance assurance review that looked at the results and ensured that dates were met and adequate evidence provided.

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**Year 2000 Project Phase Completion Process**

The project managed the risk associated with not meeting the schedules and milestones through several methods. A web-based reporting process was created that
allowed immediate status reporting for all 217 projects. Additionally a 'stop light' chart was reviewed at the bi-weekly meetings. The chart analyzed the different phases of each project and flagged status when a project could be 'at risk' because the project was less than 50% complete with less than 30 days until planned completion, or the phase is behind schedule. This process proved to be more effective in the management of the project than traditional schedule reviews. This chart became one of the primary tools used by senior management and RL to evaluate the real status of the project.

X. Project Contract/Procurement Management

Procurement requirements were not known at project start up. These requirements became known after the assessment phase of a project and were incorporated into the project baselines accordingly. A large procurement effort of over $2 million occurred late in FY 1998 to accomplish renovation for several projects and accelerate schedules.

There were some initial concerns Y2K assessments and remediation resolutions would identify the need for capital equipment, the process for which funds are acquired would not support the schedule and milestones. However, no remediation efforts required capital equipment procurement.