

***Container Refurbishment Cycle Time Reduction Project***  
**Y-12 Plant**  
**Oak Ridge, TN**

**Project No. Y/DN-397**

**Team**

Tim Aloï	Gayle Keck
Perry Anthony	Clifford Miles
Tom Blair	Dan Reichert
Celina Forester	Paul Rogers
Ken Hall	Winona Richards
Todd Hawk	Phil Smallen
Bill Gordon	Ed Tilley
Scott Johnsen	

**Sponsor**

Paul Wasilko

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## **I. Executive Summary**

In mid-1999, a Cycle Time Reduction (CTR) project was initiated by senior management to improve the overall efficiency of the Container Refurbishment process. A cross-functional team was formed by the Industrial Engineering Services group within Product Certification Organization to evaluate the current process and to propose necessary changes for improvement. The CTR team efforts have resulted in increased productivity equaling approximately \$450K per year. The effort also significantly reduced the wait time required necessary to start assembly work on the shop floor. Increasing daily production time and identifying delays were key team goals.

Following is a brief summary of accomplishments:

### **A. Productivity Improvements:**

- Reduced Radcon survey time for empty containers:  
1. 50% at 9720-3 2. 67% at 9204-2 3. 100% at 9212
- Eliminated container inspections at 9720-3.
- Reduced charged time (includes hands-on labor and support functions) per empty container by 25%.
- Reduced cycle time to refurbish a container by 25%. (Dramatic wait time reduction -Assembly)
- Reduced the time for 9212 to receive empty, refurbished containers by 67-80%.
- Reduced the time for 9204-2E to receive empty, refurbished containers from 1 day to immediate.
- Implemented software to track time charged per container for continuous improvement.
- Initiated continuous improvement efforts between Workstream experts and Refurbishment personnel. Reworded complex Workstream prompts to allow worker data corrections. Reduces time of support groups, Workstream personnel, and Refurbishment personnel.
- Consolidated refurbished, container warehousing areas. Eliminated long travel times to areas outside the protected area portals to an area in the vicinity of the refurbishment area and a process area. Benefits are improved container flow and better housekeeping.
- Improved overall communication of team by flowcharting entire process.

### **B. Annual Cost Savings:**

\$453K Annual Savings      One time cost: \$13K

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## **II. PROJECT OVERVIEW**

### **2.1 Background**

An initial assessment of Disassembly and Storage (DSO), Container Refurbishment operations at the Y-12 Plant revealed that there appeared to be opportunity to improve productivity and efficiency. The assessment resulted in management's decision to initiate a process improvement team utilizing the Cycle Time Reduction (CTR) methodology. The goal of the team was to reduce operating costs by improving material flow and to eliminate any activities that did not add value to the process, while meeting production demands in accordance with applicable health and safety requirements.

The project team was multi-functional and included key Lockheed Martin Energy Systems (LMES) personnel from both assembly and support operations. The CTR team reviewed potential opportunity areas concerning radiological control surveys, inspections, communication, container flow, role of support functions, and cost control. The team identified improvements that saved or avoided costs and reduced nonproductive time.

The team was empowered by management to review and challenge the overall process and program activities. As this report illustrates, not only was the team successful in meeting this goal, but they have also greatly enhanced their overall knowledge of the Container Refurbishment program/processes which is a key ingredient in continuous improvement and integrated safety management.

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## 2.2 Cycle Time Reduction Process Overview

Cycle Time Reduction (CTR) is an action-oriented team-directed approach to streamlining any process, whether manufacturing, administrative, engineering, etc. Teams, comprised of individuals involved in the process, are empowered by management to challenge their entire system and redesign and implement a more responsive process. The overall quality of the system is also often improved since feedback mechanisms are streamlined as well. In addition, since most improvements developed and implemented by the team usually require minimal capital, the CTR methodology is low cost, where the major expenditures are due to time contributed by the team. The end result of a successful CTR project is an improved, more responsive process in use. This is an attribute, which separates CTR from other improvement methodologies, where the effort is a study and the end objective is the production of a report. With CTR, the team not only redesigns the system on paper, but also executes the necessary actions, once validated by the sponsors, to realize the improved system.

CTR projects are particularly effective on processes that are cross-functional and involve various areas of the plant. Such is the case with the Container Refurbishment project which involves assignments in various sections of the Y-12 Plant including warehousing, scheduling, packaging, Workstream tracking, Radcon surveys, inspections, material movement, refurbishment, etc.

The generic steps of the CTR Process are outlined below:

- Identify core team members and facilitator
- Facilitator becomes oriented with the process and members through interviews, walkdowns, etc.
- Facilitator conducts kick-off meeting – briefs team on value vs. non-value added activities
- Team determines missions and goals
- Team develops as-is flow for entire process
- Team defines and support process redesign and improvement activities
- Team develops action plan
- Team implements action plan
- Facilitator prepares final report which includes improved process and cost saving/avoidance
- Team conducts project close-out session

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### 2.3 Team Members

The team was composed of employees who have direct "hands-on" involvement in Container Refurbishment and employees who play key roles from various support groups within Y-12. Core team members included:

Perry Anthony	Warehouse
Tom Blair	Quality
Celina Forester	Workstream
Gayle Keck	Scheduling
Todd Hawk	Industrial Engineering
Scott Johnsen	Packaging
Clifford Miles	EUO Supervisor
Winona Richards	Radcon
Paul Rogers	Industrial Engineering
Phil Smallen	Assembly (Container Refurbishment)
Ed Tilley	Material Movement

The following subject matter experts were added to the team to work specific activities:

Bill Gordon	Radcon
Dan Reichert	Radcon
Tim Aloï	Radcon
Ken Hall	Container Refurbishment Supervisor

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### III. PROCESS IMPROVEMENTS

The pre-analysis phase for the CTR effort defined the project scope, the process, and identified potential team members. This phase involved touring the various container refurbishment areas and interviewing both production and support personnel. The area visits and interviews led to the drafting of a process flow diagram, identification of improvement opportunities and a preliminary list of personnel from the team. This phase of the project concluded with a brief meeting with the project sponsor, a list of team members, and an initiation letter to begin the CTR project.

The next phase of the project was the Kick-Off meeting with the team members. In this meeting the team came to “mission level” by developing/revising flow charts of the entire process which illustrated container receipts, in-plant movements to warehouses and production areas, refurbishment, and final shipments. The team made numerous refinements to the flow diagrams. Additionally, the team discussed the need to show improvement in cost reduction. Financial data was circulated in the meeting.

Once the team developed the correct process flow, numerous opportunities for improvement to the flow and process were identified in team meetings and brainstorming sessions. Additionally, as suggested by one of the team members, opportunities for improvement were identified from work surveys, which were distributed to area co-workers not participating directly on the team.

The potential opportunities for improvement were then entered and categorized into manageable bins, which were assigned to sub-teams. This approach allowed for efficient review of opportunities.

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### 3.1 Process Improvement Summary

#### General Accomplishments

- Multi-Functional Active CTR Team
- Flow Diagram of Entire Container Refurbishment Process
- Area Walkdowns

#### Implemented Improvements

- Communication Improvement
- Elimination of Inspections
- Numerous Shop Floor Improvements
- Unit Costs Improvement
- Improvement of Container Flow

#### Recommendations

- Meet Necessary Requirements to Place Elevator #1 in 9204-2 into Service
- Continue Efforts to Revise Workstream to Minimize Data Entry Errors
- Make frequent clockings into Workstream to Speed the Process (i.e. Certification Process)

### 3.2 General Accomplishments

As stated previously, perhaps the greatest benefit achieved as a result of the CTR project is the knowledge gained by the team about the entire operation. Often, those involved in a process understand only their portion. After seeing all steps in the entire process, those involved will bond, working to reach a common goal and assisting one another when necessary even after the CTR project is completed, and ultimately improving end product quality and enhancing the responsiveness of their delivery system.

Such is the case with this CTR project whose participants quickly became a multi-functional active team. By performing area walkdowns, the team was able to produce a flow diagram of the Container Refurbishment process. For many it was the first time they understood the many activities this required. This proved to be a very helpful tool in identifying duplication in activities, especially with the sampling work.

Not only was the team able to plot and challenge the entire process on paper, but they also were successful in executing actions that have already resulted in an improved system. Those actions, along with additional recommended improvement actions are outlined in the following two sections.

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### 3.3 Implemented Improvements

This section describes the improvements the team has implemented thus far. Cost savings/avoidance and productivity improvements have been calculated and are summarized in Appendix A.

#### ***Activity 1: Communication Improvement***

A topic from the brainstorming sessions and the work surveys was the need for better communication. Much of this was attributed to the frequent schedule changes for containers received into the plant from other external facilities. It was decided that container schedules external to the Y-12 Plant was not within the scope of this CTR effort. Additionally, container arrivals into the refurbishment area from other Y-12 facilities are somewhat random. Because the demand for containers fluctuates dramatically, team members mentioned that it is difficult to predict when Container Refurbishment work can be scheduled. At times, this can result in an unbalanced workload for hourly workers in addition to key personnel supporting refurbishment getting called away from other plant jobs without notice.

Examples of communication difficulties:

- 1) Inspection. Inspectors must stop work on a scheduled process within Y-12 to respond to container refurbishment on short or no notice. Inspection personnel stated that it is difficult to staff for this activity because of the uncertainty of how much work or when containers will be ready for inspection.
- 2) Radcon. Radcon indicated that it is difficult to know how much support will be required due to the random arrivals of containers.
- 3) CPC Card Printer. Completion of the certification package for a container requires printing out a CPC card. This card is required before processing a shipment can begin. The team discovered that the printer used to print CPC cards was a shared, network printer that was heavily utilized on non-CPC card work by other personnel. This contributed to the delays in issuing CPC cards.
- 4) Workstream. Users of Workstream in the work area did not always understand the questions or prompts on the screen. Also, the users were not allowed to make corrections to immediate data entry errors.

Through the CTR efforts the team was able to eliminate the need for inspections at a facility, simplify Radcon methods, and establish open lines of communication between the Refurbishment supervisor and the Workstream subject matter expert to reduce errors. Errors in Workstream can cause delays during certification audits. Additionally, the Quality Services representative was relying on a shared community printer to generate CPC cards. This effort proved to be time consuming often contributing to the shipping delays for outgoing containers. Through the efforts of the team, a dedicated printer for CPC cards was installed in the employee's office thus reducing the time to complete container certifications. Subsequent sections of this report give further detail regarding these improvements. Additionally, the team recommended that additional personnel should be invited to attend the weekly Container Refurbishment meetings to discuss potential problems, issues, and to learn more about weekly and daily scheduling. As a result, these groups were placed on meeting and minutes distribution

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As the team flowcharted the entire process, including support functions, each member began to view the refurbishment process from an overall systems perspective rather than isolated pieces of work. With this insight, the team members gained knowledge that allowed the identification of how their work impacts others and the impacts to the overall container refurbishment process. An example of this team learning is the understanding of what triggers the Certification process. The team was made aware of the need to clock containers as frequent as possible once inspected so the Certification process can begin. This action resulted in quicker overall turn around time by starting Certification earlier in the cycle.

Communication improvement, although difficult to quantify in tangible cost savings, is extremely beneficial to making operations more efficient and productive. The CTR process itself was determined to be a tremendous communication improvement tool for the team.

### **Activity 2: Inspections**

In an attempt to distinguish value-added from non-value added activities, the CTR team focused on the inspection of containers after the refurbishment process and prior to shipment. A typical inspection includes visual examination of inner and outer portions of the empty container. This inspection process begins with the Container Refurbishment Supervisor contacting an inspector. Once an inspector arrives, each container is inspected upon exit of building 9204-2. The same containers get inspected again upon arrival at building 9720-3. The team determined that the second inspection of the same containers was unnecessary and non-value added. No requirements existed for performing the second inspection. Furthermore, this inspection was commonly known as a “courtesy” inspection based on past practice. After team consensus was reached, an organizational approval form for eliminating the inspection was routed. After no objections to omitting this practice were raised, the “courtesy” inspection was eliminated.

The elimination of this redundant inspection was also significant in reducing the time spent by the inspectors, which includes actual inspection time and travel time. Additionally, the elimination of the inspection reduces the time spent coordinating the effort by the packaging supervisor in addition to reducing the time needed to prepare the containers for shipment for the packaging personnel.

### **Activity 3: Shop Floor Improvements**

The team determined that cycle time reduction on the shop floor would have significant positive impacts to the overall flow of containers in the Container Refurbishment cycle including reducing the probability of delaying a shipment. Since the number of Assembly workers has been reduced significantly, the team felt that simplifying the process on the floor would help ensure that container refurbishment schedules could be met. The goal was to be able to meet the demand for refurbishing containers by better utilizing the available workforce. The method to accomplish this was to work smarter not harder.

#### **A) 9204-2 RADCON**

The team, including input from additional 9204-2 shop floor workers, agreed that a major bottleneck in the Container Refurbishment process was due to the radiological surveys performed on each container. The current method for checking a container for radiological contamination was direct surveys. This method is a labor-intensive survey taking on average 1.5 hours per container. After numerous consultations with specialists from the Radiological Control Organization, an equivalent method for detecting removable contamination was determined to be a suitable replacement for the labor intensive direct surveys. Radcon specialists determined that the smearing method is suitable

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for shipping empty radiological containers under DOT regulations (Title 49 CFR Part 173). This provision is also covered under current Radcon procedure Y75-56-FO-108 "Receipt and Transport of Radioactive Material Shipments."

The change in the Radcon survey method results in tremendous timesavings for the Radcon technician. More significantly however, is the wait time for assembly personnel from 1.5 hours to .5 hours per container, because they no longer were waiting on survey results before starting work.

#### **B) 9720-3 RADCON**

Refurbished containers that get shipped offsite are staged at 9720-3 Packing. Similarly, to 9204-2 each container underwent excessive Radcon surveys. It was determined that direct and smear surveys should be replaced by dose rate surveys. This improvement eliminated 20 minutes of survey time per container, in addition to elimination of wait time by the hourly workers. Additionally, this improvement reduced the time required for the 9720-3 supervisor and hourly personnel to prepare containers for final shipment.

#### **C) 9212 RADCON**

According to a team member from 9212, empty, refurbished containers that come from 9204-2 are being re-surveyed in 9212. In a 9212 operating procedure under Preloading Checks and Inspections, an Operator is required to "Request RADCON personnel survey empty container". Coordinating this event and waiting for RADCON personnel to complete this task takes time, which reduces the available production time in that particular area. The procedure was changed to eliminate the need to re-survey the empty, refurbished containers. The elimination of this survey was based on the fact that the container had already been surveyed by Radcon technicians in 9204-2 and was determined to be clean of radioactive contamination.

#### **D) Optimization of Lot Size for Containers Opened in to 9204-2**

A significant area of improvement for Container Refurbishment was to level the workload to allow a more even flow of work for assembly personnel in 9204-2. The team determined opening fewer containers at one time inside the work area would allow Radcon to survey smaller groups of containers at one time prior to releasing to assembly personnel to refurbish. This lot size reduction is preferred by the Radcon technician because of the timesavings. Furthermore, this approach permits smaller groups of containers to move through the system quicker to create a more continuous flow. Additionally, fewer containers get clocked at a more frequent rate, which permits Certification to begin sooner. This optimization equates to significant annual cost savings.

#### **E) Workstream Improvements**

Between various container refurbishment operations, Assembly personnel and the supervisor must make clockings to Workstream. Within the Workstream input screens, prompts that require user input can be intimidating and confusing depending on the sequence on screens for a particular container type. As a result, numerous entry errors were being made and were have to be corrected by Workstream personnel.

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Workstream is undergoing programming changes to provide second chance prompts that asks the user to verify if the answers are correct before saving them to the database. This greatly reduces the number of errors which save significant time.

#### **F) Inspection Clockings**

Inspection personnel were going back to their offices to make clockings into Workstream vs. utilizing the area terminal. This was causing unnecessary delays. Realizing an improvement potential, the 9204-2 Supervisor stated that the terminal in his area is available for use for anyone who needs to clock. Most of the inspectors have begun using the Supervisor's terminal in 9204-2. The CTR recommends and encourages that all inspectors begin this practice.

#### **Activity 4: Unit Costs**

Data gathered during the CTR effort identified that hands-on assembly work accounted for only approximately 6% of the total cost. The remainder was divided among mission support, overhead, and support functions. The team discovered that many individuals from support groups were incorrectly charging their time to Container Refurbishment when actual time was spent on other types of work activity. In addition, some individuals were charging the same block of time regardless of how many containers get refurbished during the month.

To address this problem, a PC software application called Project Efficiency Application was developed to track actual charges against standard values and to forecast work loads, given a specified number of containers. The program compares PALS data with computed time values from the product of standard values and monthly, refurbished container quantities. Before each work period (month), the application will generate a work estimate in hours based on the intended number of containers to be refurbished. After the work period, it will compute efficiencies for each work group and the total Container Refurbishment project (by program charge number). Additionally, the application picks up personnel badge numbers that are not "registered" to charge against a specific Container Refurbishment account.

Operations personnel are now actively correcting inaccurate charges. As illustrated in Appendix E, the time charged per container has dropped by more than 25%.

#### **Activity 5: Improvement of Container Flow**

##### **A) Consolidation of Storage**

During the flowcharting process, the team determined that the current flow of containers was inefficient. In particular, after containers were refurbished in 9204-2, they were often moved to warehouses that were not in the vicinity of 9204-2 and in some cases on the other end of the plant. The team identified an area in 9204-2 that could be cleared out to provide enough storage space for the containers. As illustrated in Appendix B, the establishment of this area has greatly improved the flow and allows for immediate receipt of containers in 9204-2E.

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**B) Consolidation of Operations**

According to a work survey early in the CTR effort, all packaging hands-on activities needed to be consolidated into one area (protected area). This would reduce excessive handling, storage, movement, and Radcon costs.

Various ideas and proposals were suggested. Based upon a management recommendation, a field trip was taken to one of the warehouses to determine if container refurbishment operations could be relocated. Based upon the results of the field trip, the comments from workers (both at the warehouse and the current Container Refurbishment facility), the team recommended that relocation of the operations not take place (under current conditions). The pros and cons for relocation to an existing warehouse are available in another report. Although a recommendation for relocation was not made by the team, all individuals agreed that the concept of consolidation was an excellent idea and could possibly be done given the appropriate facility (i.e. facility from plant modernization efforts).

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### 3.4 Recommended Process Improvements

#### *Meet Necessary Requirements to Place Elevator #1 in 9204-2 into Service*

Elevator #1 is vital for efficient flow of empty containers to container storage and to 9204-2E. This elevator has recently been upgraded for newer parts and components. This repair has initiated more recent guidelines for inspecting elevators, per ASME standards for hydraulic elevators. The new standards call for maximizing the lift of the elevator beyond routine ranges. The elevator shaft is currently housed with a fire sprinkler system that inhibits the full test-out of the elevator. In order for the elevator to complete required tests per ASME, the sprinkler system would need to be re-routed along the sides of the wall instead of spanning the top of the shaft.

A detailed work package, addressing applicable health and safety concerns (with required approvals), would need to be completed prior to initiating the sprinkler system change.

#### *Continue Efforts to Revise Workstream to Minimize Data Entry Errors*

One of the efforts of the CTR team was to bring the Workstream representative and the Container Refurbishment supervisor together in a collaborative effort. While all would agree that the efforts produced positive results, the team emphasizes that this is an improvement effort that should be continued. The team recommends that Workstream representatives and workers in the Container Refurbishment area continue to make improvements by simplifying Workstream prompts, allowing edits by the user (immediate errors only), and any other opportunities that can be realized. This recommendation also includes management support to allow these collaborative efforts to continue.

#### *Make frequent clockings into Workstream to Speed the Process (i.e. Certification Process)*

One of the key opportunities realized by the CTR team, was the importance of making frequent clockings. This is especially true prior to the clockings before the Certification process. The clockings by the Inspectors and the Supervisor/Assembly personnel should be done as often as possible because this clocks containers to the Quality Systems representative, who initiates the certification. Certification is one of the last steps in the cycle but can be a constraint when trying to ship containers. Inspectors should utilize the workstation in the Container Refurbishment area rather than traveling back to an office location. Additionally, the team pointed out the advantage to clocking fewer containers more often to smooth out the schedule for Quality Services. For a hypothetical example, 4 containers could be clocked each day rather than 20 at the end of the week. This permits Quality Services to start certifying sooner. The general recommendation is the continuance of more frequent clockings in the future.

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## **APPENDIX A**

### **Summary of Improvements**

#### **A. Productivity Improvements:**

- Reduced Radcon survey time for empty containers:  
1. 50% at 9720-3    2. 67% at 9204-2    3. 100% at 9212
- Eliminated container inspections at 9720-3.
- Reduced charged time (includes hands-on labor and support functions) per empty container by 25%.
- Reduced cycle time to refurbish a container by 25%. (Dramatic wait time reduction -Assembly)
- Reduced the time for 9212 to receive empty, refurbished containers by 67-80%.
- Reduced the time for 9204-2E to receive empty, refurbished containers from 1 day to immediate.
- Implemented software to track time charged per container for continuous improvement.
- Initiated continuous improvement efforts between Workstream experts and Refurbishment supervisor to reword complex Workstream prompts and to allow worker data corrections reducing time of support groups, Workstream personnel, Refurbishment supervisor/laborer, and certification process.
- Consolidated refurbished, container warehousing from areas with long travel times and outside protected area portals to an area in the vicinity of the refurbishment area and a process area. Benefits are improved container flow and better housekeeping.
- Improved overall communication of team by flowcharting entire process.

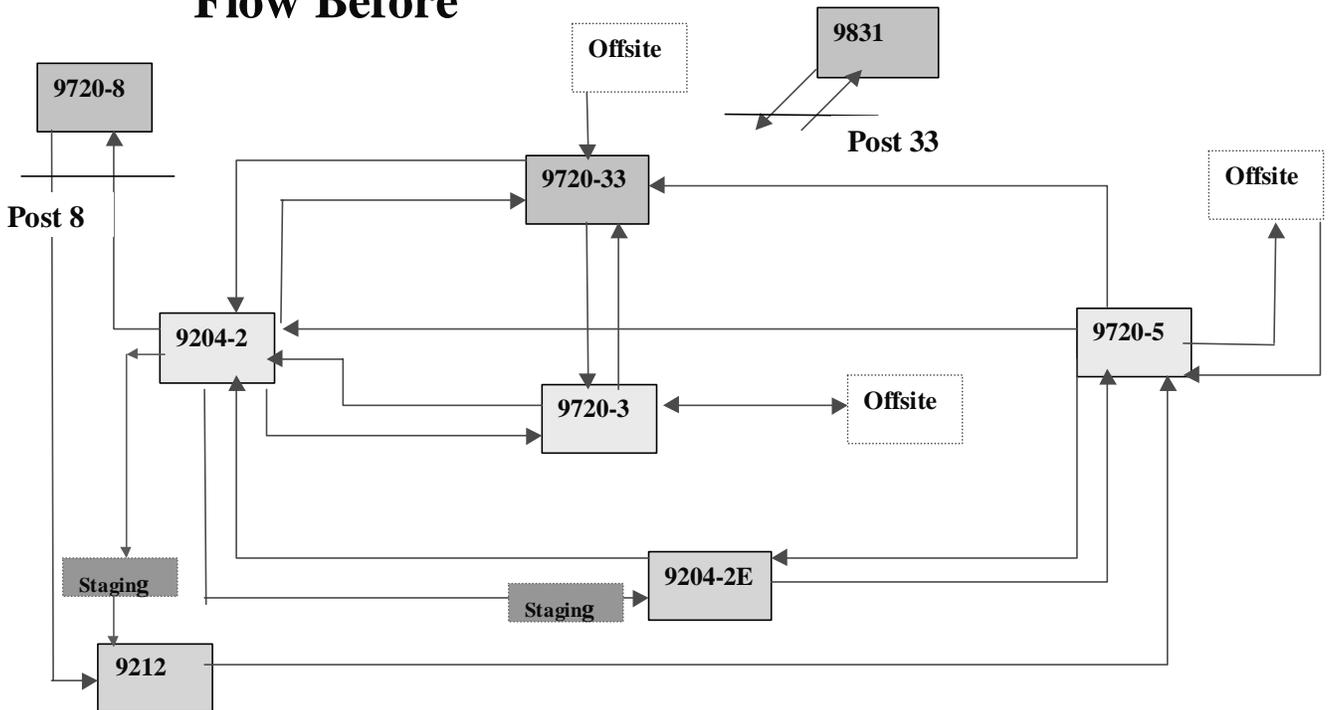
#### **B. Annual Cost Savings:**

\$453K Annual Savings      One time cost: \$13K

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**APPENDIX B**  
**Flow Diagram Before**  
**(Page 1 of 2)**

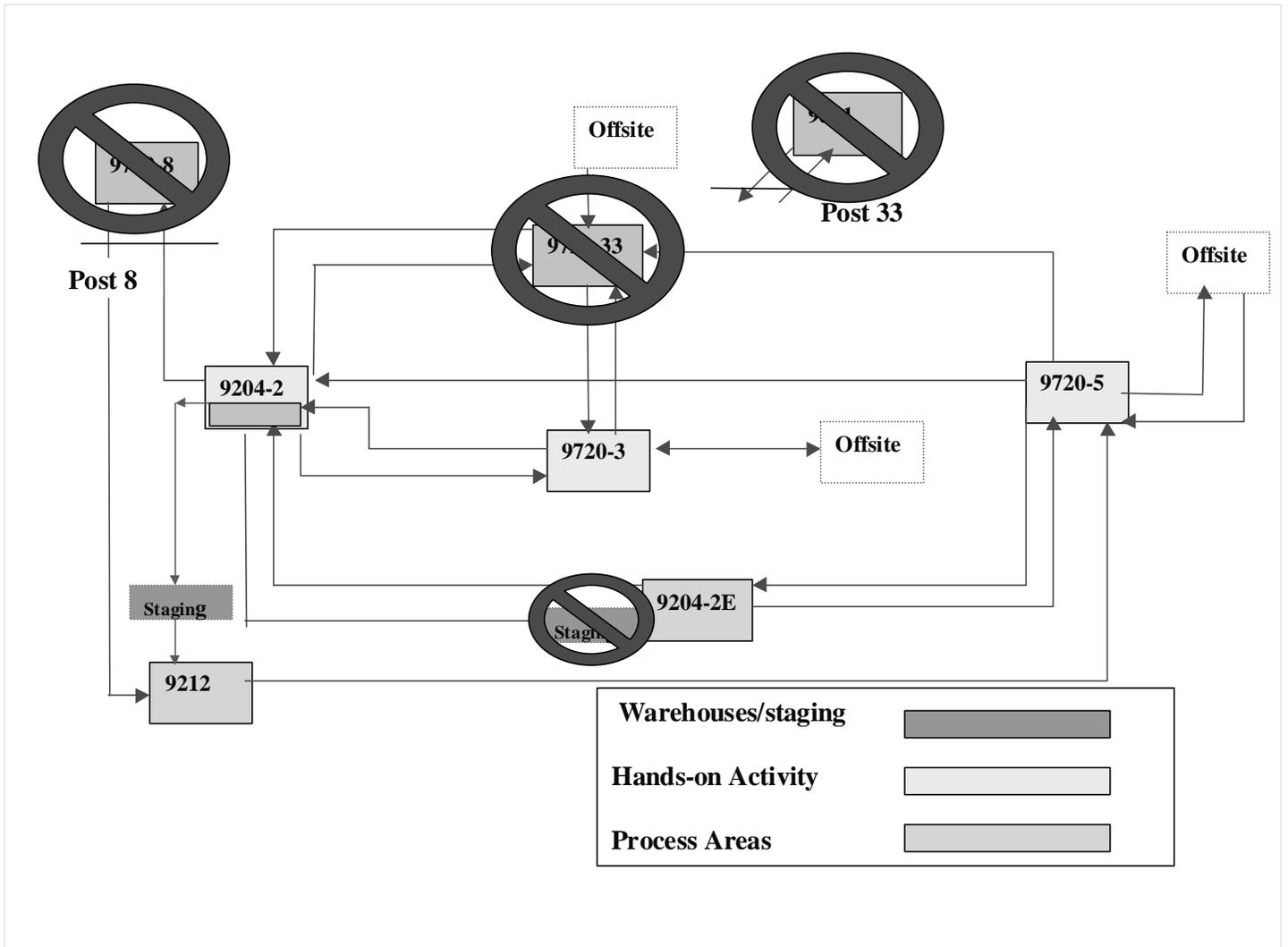
**Flow Before**



<b>Warehouses/staging</b>	
<b>Hands-on Activity</b>	
<b>Process Areas</b>	

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**APPENDIX B**  
**Flow Diagram After**  
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**APPENDIX C**  
**Container Photo**



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**APPENDIX D**  
**Storage Area Before**  
**(Page 1 of 2)**



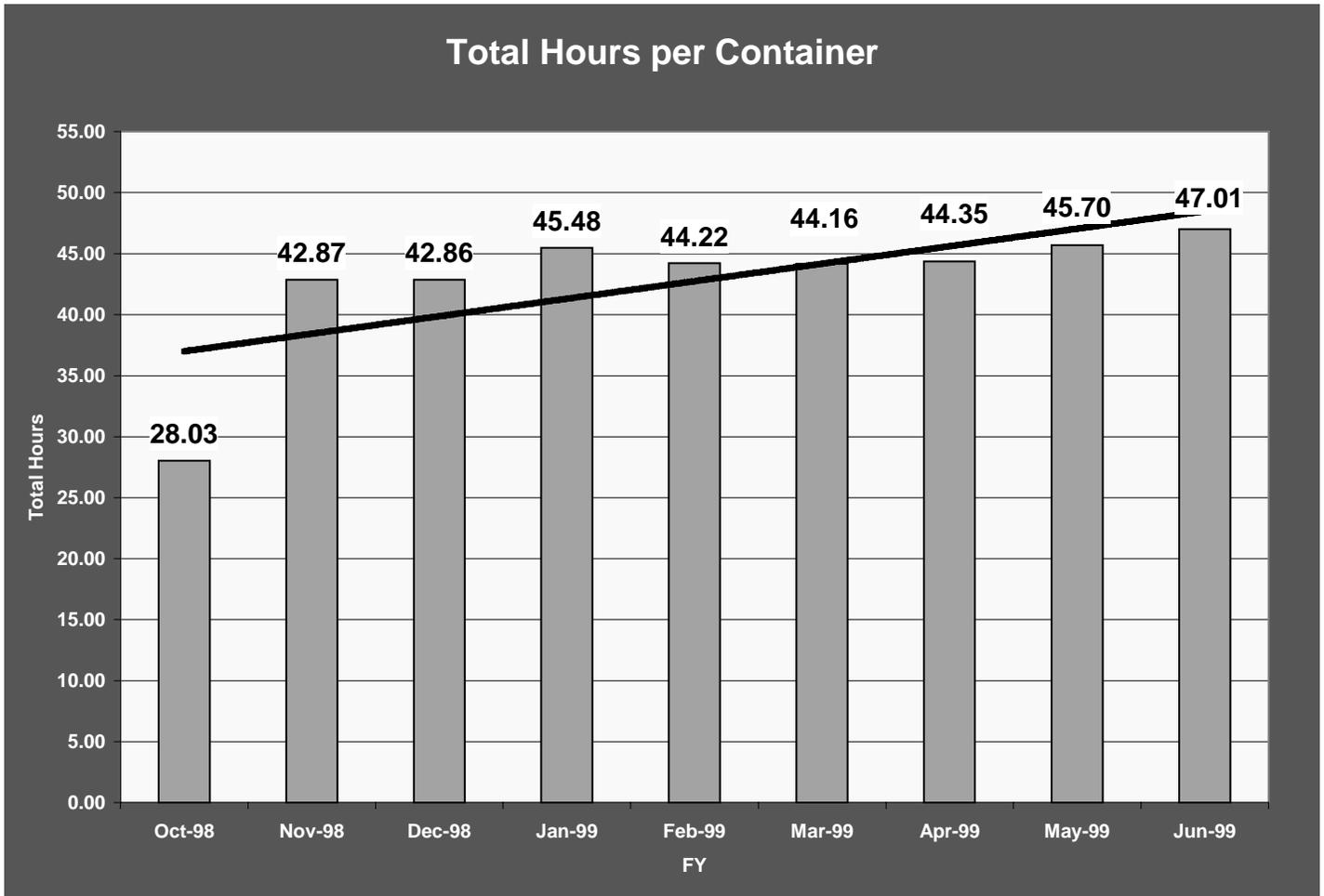
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**APPENDIX D**  
**Storage Area After**  
**(Page 2 of 2)**



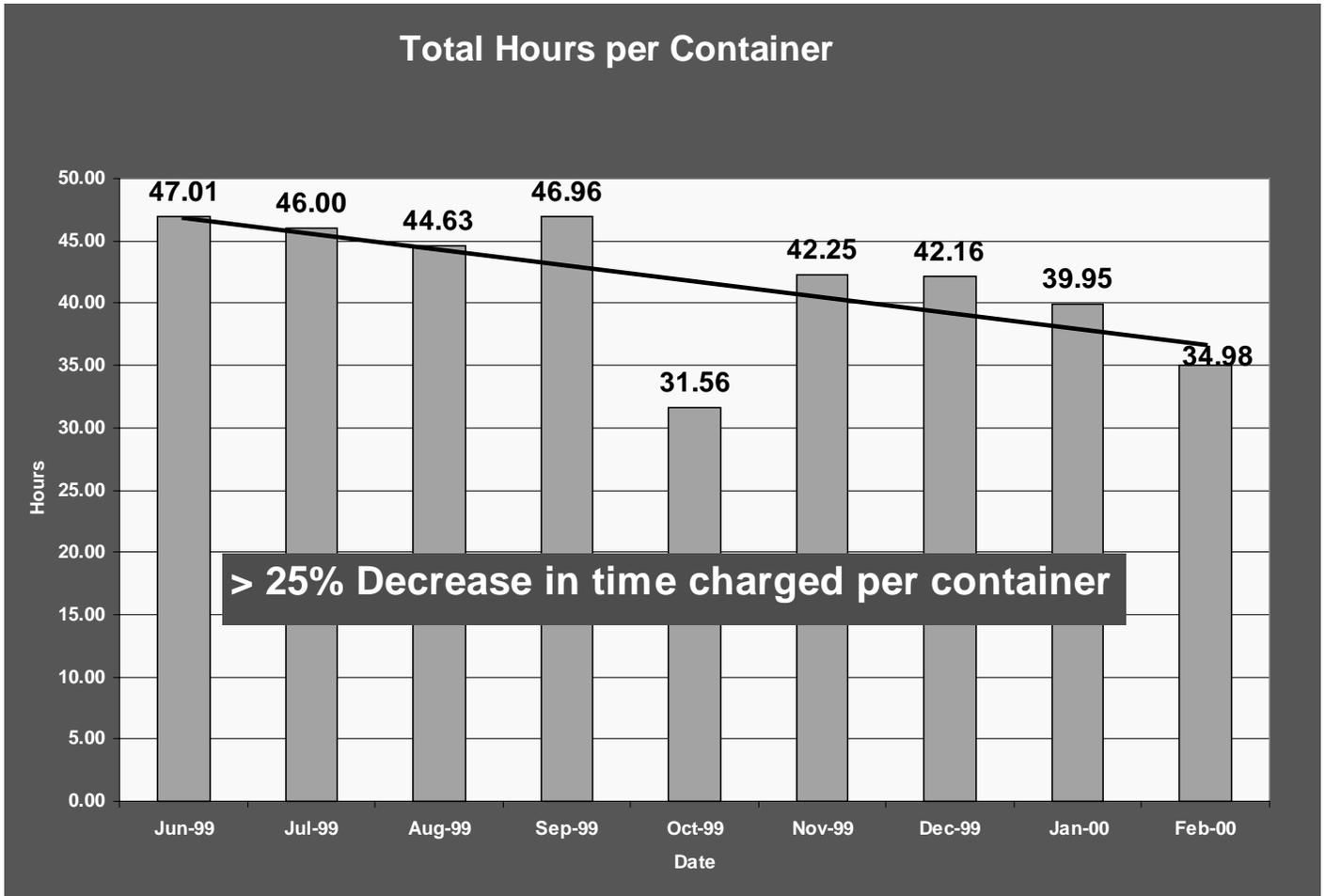
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**APPENDIX E**  
**Hours per Container Before**  
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**APPENDIX E**  
**Hours per Container After**  
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## **APPENDIX F**

### **Summary Status of Process Improvements**

- |   |                  |
|---|------------------|
| • Communication Improvement   | Complete         |
| • 9720-3 Inspections Eliminated   | Complete         |
| • Optimization of Lot Size  | Complete         |
| • Replace Direct Radiological Surveys at 9204-2 with Smears               | Complete         |
| • Replace Direct Radiological Surveys and Smears at 9720-3 with Dose Rate | Complete         |
| • Eliminate Radiological Re-surveys at 9212                               | Complete         |
| • Installation of Dedicated CPC Printer (Certification Improvement)       | Complete         |
| • Designed and Installed Efficiency Tracking Software                     | Complete         |
| • Reduction in Certification Time   | Complete/Ongoing |
| • Modifications to Workstream   | Complete/Ongoing |
| • Provision to Allow Inspectors to Clock in Supervisor's Area             | Complete         |
| • Consolidation of Container Storage                                      | Complete         |
| • Repair of Elevator #1 in 9204-2 for Better Material Flow                | Recommendation   |

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## APPENDIX G Project Awards (Page 1 of 3)

<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; font-size: small;">FOR USE BY AWARDS RESOURCE PERSON</td> </tr> <tr> <td style="font-size: x-small;">NOMINATING ORGANIZATION'S PRIORITY</td> </tr> <tr> <td style="font-size: x-small;">NOMINATING ORGANIZATION'S ID NO.</td> </tr> </table>	FOR USE BY AWARDS RESOURCE PERSON	NOMINATING ORGANIZATION'S PRIORITY	NOMINATING ORGANIZATION'S ID NO.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="font-size: small;">NOMINEE'S NAME (LAST NAME, INITIALS) Container Refurbishment CTR Team</td> </tr> </table>	NOMINEE'S NAME (LAST NAME, INITIALS) Container Refurbishment CTR Team								
FOR USE BY AWARDS RESOURCE PERSON													
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NOMINATING ORGANIZATION'S ID NO.													
NOMINEE'S NAME (LAST NAME, INITIALS) Container Refurbishment CTR Team													
<p>LOCKHEED MARTIN ENERGY SYSTEMS, INC. <b>Y-12 AWARD OF EXCELLENCE</b></p>													
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">TYPE OF AWARD <input type="checkbox"/> INDIVIDUAL    <input checked="" type="checkbox"/> TEAM*</td> <td style="width: 50%; font-size: x-small;">*FOR TEAM AWARD, USE ATTACHMENT B TO LIST PERTINENT INFORMATION FOR TEAM MEMBERS OTHER THAN THE NOMINEE.</td> </tr> </table>	TYPE OF AWARD <input type="checkbox"/> INDIVIDUAL <input checked="" type="checkbox"/> TEAM*	*FOR TEAM AWARD, USE ATTACHMENT B TO LIST PERTINENT INFORMATION FOR TEAM MEMBERS OTHER THAN THE NOMINEE.											
TYPE OF AWARD <input type="checkbox"/> INDIVIDUAL <input checked="" type="checkbox"/> TEAM*	*FOR TEAM AWARD, USE ATTACHMENT B TO LIST PERTINENT INFORMATION FOR TEAM MEMBERS OTHER THAN THE NOMINEE.												
NOMINEE INFORMATION													
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">NOMINEE'S NAME (LAST NAME, INITIALS) Container Refurbishment CTR Team</td> <td style="width: 33%;">PREFERRED NAME</td> <td style="width: 33%;">NOMINEE'S ORGANIZATION <input checked="" type="checkbox"/> Y-12    <input type="checkbox"/> TECHNICAL PARTNERSHIPS</td> </tr> <tr> <td>NOMINEE'S CURRENT DIVISION Multiple Divisions</td> <td>CURRENT PAYROLL <input checked="" type="checkbox"/> HOURLY <input checked="" type="checkbox"/> WEEKLY <input checked="" type="checkbox"/> MONTHLY</td> <td><input type="checkbox"/> ETPP    <input type="checkbox"/> CENTRAL AND GENERAL STAFF</td> </tr> <tr> <td>BADGE NUMBER</td> <td></td> <td><input type="checkbox"/> CRNL <input type="checkbox"/> OTHER _____</td> </tr> </table>	NOMINEE'S NAME (LAST NAME, INITIALS) Container Refurbishment CTR Team	PREFERRED NAME	NOMINEE'S ORGANIZATION <input checked="" type="checkbox"/> Y-12 <input type="checkbox"/> TECHNICAL PARTNERSHIPS	NOMINEE'S CURRENT DIVISION Multiple Divisions	CURRENT PAYROLL <input checked="" type="checkbox"/> HOURLY <input checked="" type="checkbox"/> WEEKLY <input checked="" type="checkbox"/> MONTHLY	<input type="checkbox"/> ETPP <input type="checkbox"/> CENTRAL AND GENERAL STAFF	BADGE NUMBER		<input type="checkbox"/> CRNL <input type="checkbox"/> OTHER _____				
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USE ATTACHMENT A TO DESCRIBE IN DETAIL THE NOMINEE'S ACCOMPLISHMENT.													
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UCN-16980 (1256 8-07)													

Subject: Container Refurbishment Cycle Time Reduction Project

**APPENDIX G  
Project Awards  
(Page 2 of 3)**

ATTACHMENT A

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TITLE

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**DETAILED DESCRIPTION OF ACCOMPLISHMENT**  
*(NOTE: MAXIMUM LENGTH 250 WORDS.)*

A. Productivity Improvements:

Reduced Radcon survey time for empty containers:  
1. 50% at 9720-3 2. 67% at 9204-2 3. 100% at 9212

Eliminated container inspections at 9720-3.

Reduced charged time (includes hands-on labor and support functions) per empty container by 25%.

Reduced cycle time to refurbish a container by 25%. (Dramatic reduction in wait time for assembly personnel).

Reduced the time for 9212 to receive empty, refurbished containers by 67-80%.

Reduced the time for 9204-2E to receive empty, refurbished containers from 1 day to immediate (JIT).

Implemented software to track time charged per container for continuous improvement.

Initiated continuous improvement efforts between Workstream experts and Refurbishment supervisor to reword complex Workstream prompts and to allow worker data corrections reducing time of support groups, Workstream personnel, Refurbishment supervisor/laborer, and certification process.

Consolidated refurbished, container warehousing from areas with long travel times and outside protected area portals to an area in the vicinity of the refurbishment area and a process area. Benefits are improved container flow and better housekeeping.

Improved overall communication of team by flowcharting entire process.

B. Annual Cost Savings:

\$453K Annual Savings      One time cost: \$13K

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**EXECUTIVE SUMMARY**

In response to plant management's request to evaluate the productivity and efficiency in Disassembly and Storage (DSO's) Container Refurbishment operations at the Y-12 Plant, an initial assessment revealed that significant improvements in 9204-2 Container Refurbishment process could be realized. In addition, the process could further be streamlined by including those groups that support the Container Refurbishment process at Y-12. The assessment resulted in management's decision to initiate a process improvement team utilizing the Cycle Time Reduction (CTR) methodology. The goal of the team was to reduce operating costs by improving material flow and to eliminate any activities that did not add value to the process, while meeting production demands in accordance with applicable health and safety requirements.

The CTR team reviewed potential opportunity areas concerning radiological control surveys, inspections, communication, container flow, role of support functions, and cost control. The team identified improvements that saved or avoided costs and reduced nonproductive time.

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Subject: Container Refurbishment Cycle Time Reduction Project

**APPENDIX G  
Project Awards  
(Page 3 of 3)**

ATTACHMENT B

TITLE

**ADDITIONAL INFORMATION FOR TEAM AWARDS**

NAME (LAST NAME, INITIALS - LIST IN ALPHABETICAL ORDER)	PREFERRED NAME	BADGE NUMBER	PAYROLL (P, W, M)	DIVISION	ORGANIZATION
Aloi TJ	Tim		M	056	Y-12
Anthony P	Perry		M	001	Y-12
Blair TL	Tom		M	055	Y-12
Forester CA	Celina		M	081	Y-12
Gordon WS	Bill		M	056	Y-12
Hall KL	Ken		M	001	Y-12
Hawk CT	Todd		M	055	Y-12
Johnsen SD	Scott		M	081	Y-12
Keck DG	Gayle		M	081	Y-12
Miles CE	Cliff		M	037	Y-12
Reichert DM	Dan		W	056	Y-12
Richards WO	Winona		W	056	Y-12
Rogers PE	Paul		M	055	Y-12
Smallen PA	Phil		H	001	Y-12
Tilley CE	Ed		M	008	Y-12

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**April 2000**  
**CONTAINER REFURBISHMENT**  
**CTR TEAM FINAL PRESENTATION**

Team Members:

Perry Anthony - Warehouse	Cliff Miles -9212
Tom Blair -Quality	Winona Richards -Radcon
Celina Forester -Workstream	Paul Rogers - Ind. Engineering
Todd Hawk - Ind. Engineering	Phil Smallen- Assembly
Scott Johnsen - Packaging	Ed Tilley - Material Movement
Gayle Keck -Scheduling	

Adhoc: Ken Hall, Bill Gordon,  
 Dan Reichert, Tim Aloï

**Agenda**

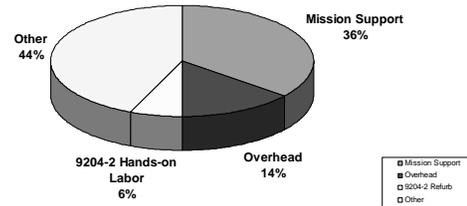
Introduction.....Todd Hawk  
 Program Improvements..... Scott Johnsen  
 Radcon Improvements.....Bill Gordon  
 Summary.....Paul Rogers

**Project Overview**

- Team initiated by Paul Wasilko to improve the efficiency of the Container Refurbishment process at Y-12.
- Focus on streamlining flow from receipt, internal handling/movements, and up to final shipment or used internally
- 12 Team members; Additional 4 adhoc
- 20 Meetings; 172 Man-hours expended



Container Refurbishment Cost Breakdown for May '99



**Assessment**

- Redundant inspections for containers
- Reduce refurbishment cycle time
- Communication could be improved
- Unit container costs are increasing
- Significant wait time for assembly personnel
- Container flow is not efficient/cost effective

*Agenda*

Introduction..... Todd Hawk  
 Program Improvements .....Scott Johnsen  
 Radcon Improvements.....Bill Gordon  
 Summary.....Paul Rogers

### Redundant Inspections of Containers

**Improvement Opportunity:**

- Containers get inspected upon exit of 9204-2
- Containers get re-inspected again in 9720-3

**CTR Team Results:**

- No requirement to re-inspect
- 9720-3 redundant inspection has been eliminated
- Packing procedure changed. Packing personnel contacts packaging engineer if obvious defects are evident

### Reduce Refurbishment Cycle Time

**Improvement Opportunity:**

- Large batch size of containers often move to refurbishment building at one time
- Workstream errors can delay process
- Inspectors do not clock workstream in the refurbishment area delaying the process

**CTR Team Results:**

- Lowering the number of containers processed in the refurbishment area at one time:
  - reduces the cycle time for containers flowing in and out
  - results in more frequent clockings (Certification process starts sooner)
  - balances the work load on the floor minimizing the high and low work periods
- Supervisor is working with Workstream expert to change user prompts for better understanding by Assembly personnel. **REDUCES WORKSTREAM ERRORS!**
- Supervisor made workstation available for Inspectors to clock, allowing Certification process to start sooner.

### Communication Improvement

**Improvement Opportunity:**

- DOE/directive schedule changes frequently
- Various work groups have difficulty planning work to fit a changing schedule

**CTR Team Results:**

- Additional groups/individuals were invited to weekly meetings
- Team recommended meeting minutes distributed to additional individuals
- CTR team became aware of the overall process flow and the relations existing between work groups. (Example improvement: Supervisor working with Workstream experts to make improvements)

### Unit Container Costs

**Improvement Opportunity:**

- Unit costs for refurbished containers has been increasing
- Volume of containers has been decreasing

**CTR Team Results:**

- Support groups are a significant portion of the total cost
- Nuclear Packaging Systems has been backing incorrect charges out of the Refurbishment work order
- Efficiency Application Software has been developed to track efficiencies of primary work groups and the entire project

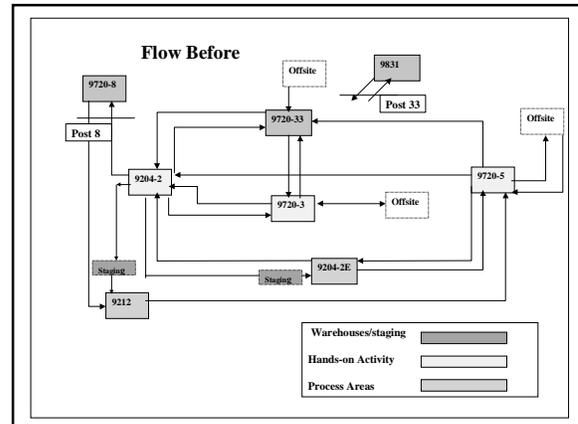
### Container Flow is not Efficient/Cost Effective

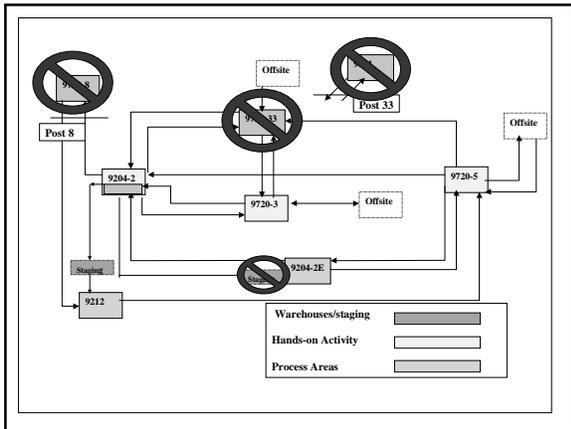
**Improvement Opportunity:**

- Containers are moved in and out of numerous buildings

**CTR Team Results:**

- Created centralized storage area for in process containers
- Eliminates/reduces moves to/from 9720-33, 9831, and 9720-8
- Reduces time for 9212 to receive containers from 3-5 days to 1 day
- Reduces time for 9204-2E to receive containers from 1 day to immediate
- Improves flow by allowing containers to be moved into process areas as needed





## Agenda

- Introduction.....Todd Hawk
- Program Improvements.....Scott Johnsen
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### Significant Wait Time for Assembly Personnel

**Improvement Opportunity:**

- There is significant amount of “wait time” for 9204-2 Assembly personnel before refurbishment work can begin.

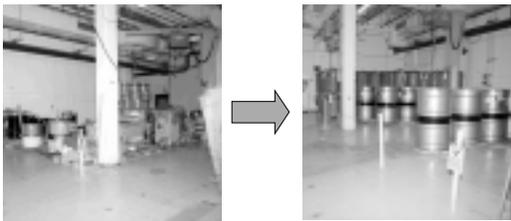
**CTR Team Results: RADCON IMPROVEMENTS**

- Implemented DOT method of shipping empty radioactive containers under provisions of Title 49 CFR Part 173
- Covered through current RADCON procedure Y75-56-FO-108 “Receipt and Transport of Radioactive Material Shipments”
- DOT method allows ELIMINATION of direct surveys on containers, while maintaining SMEARS and DOSE RATE surveys for outgoing containers

### RADCON IMPROVEMENTS

- RADCON smears replace direct surveys at 9204-2 Container Refurbishment Area (1 hour per container savings + Assembly wait time)
- RADCON performs dose rate surveys at 9720-3. Elimination of direct and smear surveys (savings of 20 minutes per drum)
- 9204-2 RADCON Tech surveys smaller lots of containers at a time due to improved workflow and logistics.
- Other: 9212 RADCON surveys at EUO eliminated for incoming containers (another example of duplication of work).
- Establishment of Radioactive Material Area (RMA) at 9204-2 for “yellow tagged containers”, eliminating unnecessary truck moves and personnel involvement.

### In-Process Container Buffer Area



### SUMMARY OF RADCON IMPROVEMENTS

- Improved **COMMUNICATION** between various RADCON personnel on container issues and workflow process
- **DUPLICATION OF WORK** eliminated at several areas through implementation of DOT method (9204-2, 9212 and 9720-3)
- Improved **WORKFLOW** and **LOGISTICS** for outgoing containers
- Deliver an end product that better meets the goals of:
  - **IMPROVED CUSTOMER SATISFACTION**
  - **REDUCTION OF TIME CHARGED** per container
  - Meeting **PROCEDURAL** and **REGULATORY** requirements

## Agenda

Introduction.....Todd Hawk  
 Program Improvements.....Scott Johnsen  
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## Summary

### Productivity Improvements

- Improved communication
- Reduction in RADCON survey time for containers at:
 

9720-3	50%
9204-2	67%
9212	100%
- 25% reduction in cycle time to refurbish containers
- Efficiency tracking software for continuous improvement
- Consolidated container storage: Less moves/handling and reduced cycle time

## Summary (continued)

- 67 -80% reduction in lead time for 9212 to receive containers
- Immediate (JIT) receipt of containers for 9204-2E
- 100% reduction of dimensional inspections in 9720-3
- Ongoing reduction in Workstream errors (impacts 9204-2 supervisor, assembly person, Quality Service, CPC card process, and overall cycle time of containers within refurbishment process)

## Summary (continued)

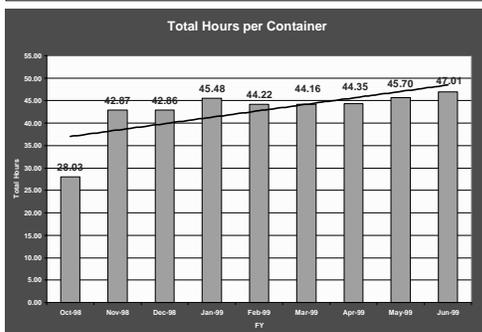
### Annual Cost Savings/Avoidance

- Projected Savings/Avoidance: \$453K annually
- Cost of project: ~\$13K (labor costs)
- Cost savings/avoidance pertain to containers refurbished for multiple customers (Pantex, LANL, LLNL, Aberdeen, Rocky Flats, other work orders)

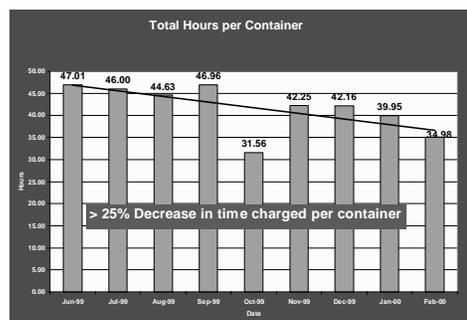
### Future Evaluation/Implementation

- Repair elevator #1 in 9204-2 for better material flow.
- Modify Workstream to allow Assembly personnel to make immediate corrections. Supervisor will identify specific prompts that need to be editable.
- If 9204-2 Refurbishment becomes a bottleneck, evaluate additional leveling of containers received into Refurbishment to balance workload, minimize inventory, and reduce 9212 lead time.

### Before CTR Project



### During/After CTR Project



# TEAMWORK

