

*National Security Technologies, LLC (NSTec)
Nevada Test Site
Site Operations*

Wrench Time Study Improvement Project

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NSTec Wrench Time Study

- During Summer 2007 an independent company performed a Wrench Time Study at the Nevada Test Site (NTS) and North Las Vegas (NLV) facilities
- The study was 8 weeks in duration and reviewed both Corrective Maintenance (CM) and Preventive Maintenance (PM)
- Wrench Time was measured utilizing the following five categories:
 - Wrench Time
 - Productive time
 - Non-Productive Time
 - Other Non-Productive Time
 - Unavailable Time
- Average wrench time across NSTec was 29%

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NSTec Wrench Time Study

- Percentage of time where craft are performing exactly as planned (little or no improvements could increase wrench time):
 - Wrench Time: 29%
 - Productive time: 26%
 - Pre- and Post-Job Briefs
 - Cleanup of Job Sites
 - Work travel
 - Other Non-Productive Time: 14%
 - Training
 - Breaks/Lunch
 - Rest Room
- **Total Percentage of Time: 69%**

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NTS Wrench Time Study

- Areas available for improvements to increase wrench time:
 - Non-Productive Time: 24%
 - Waiting for Materials/Tools
 - Waiting for Permits
 - Waiting for Others
 - Waiting Between Jobs
 - Unavailable Time: 8%
 - No other category available

- Total Percentage of Time: 32%*

*Does not add to 100% (69% + 32% = 101%) due to averaging of each category per Zone

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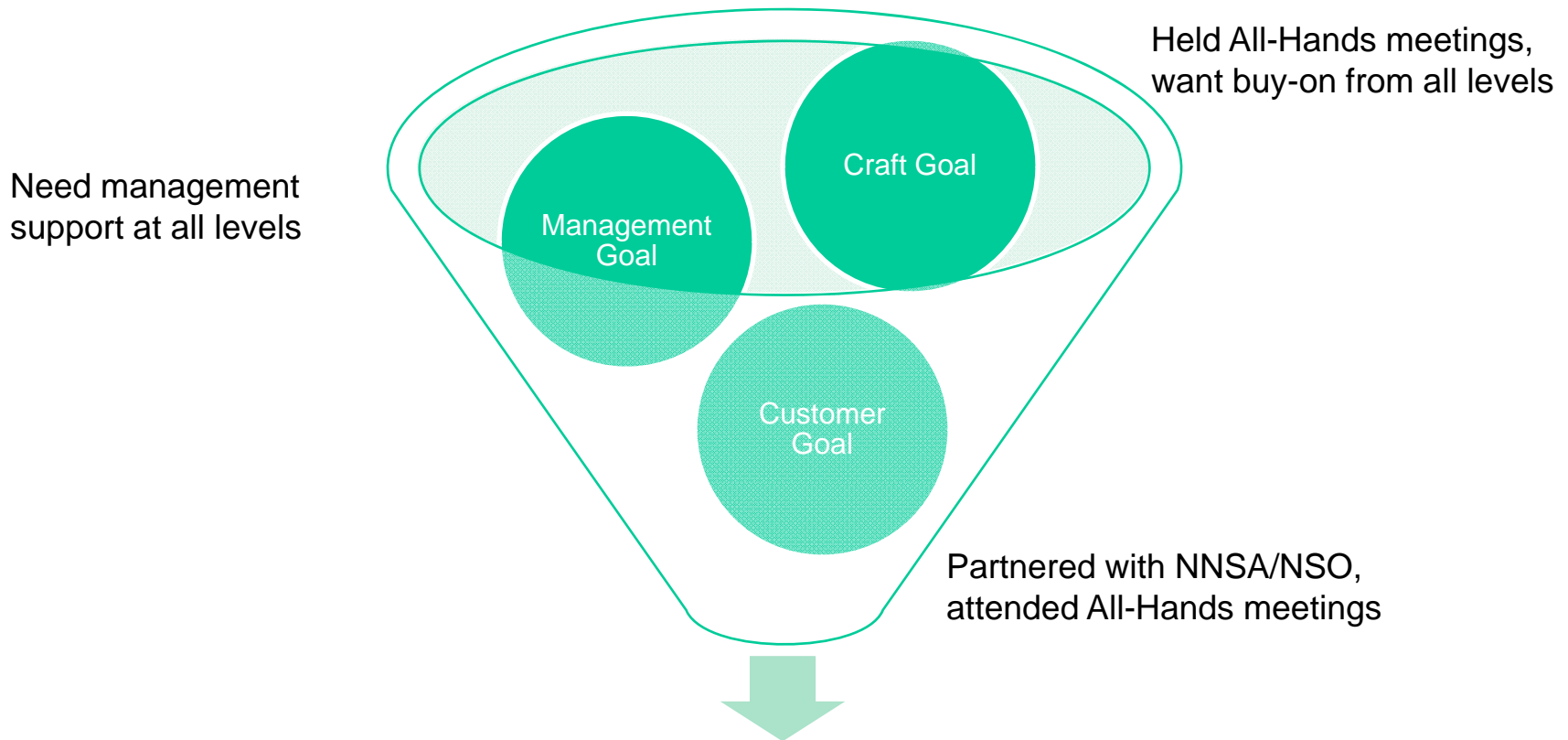
Wrench Time Study – Path to Improvement

- Decided to run Wrench Time improvement initiative as a project:
 - Appointed Project Manager
 - Set milestones with due dates
 - Established key measurements
 - Defined goal:
 - **Wrench Time Goal = 36%***
- In Summer 2009, another Wrench Time Study will be performed by an independent company at the NTS and NLV
- Need to ensure all stakeholders have the same goal to improve wrench time

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* Determined by NSO; FY09 PBI

All Stakeholders Have Same Goal

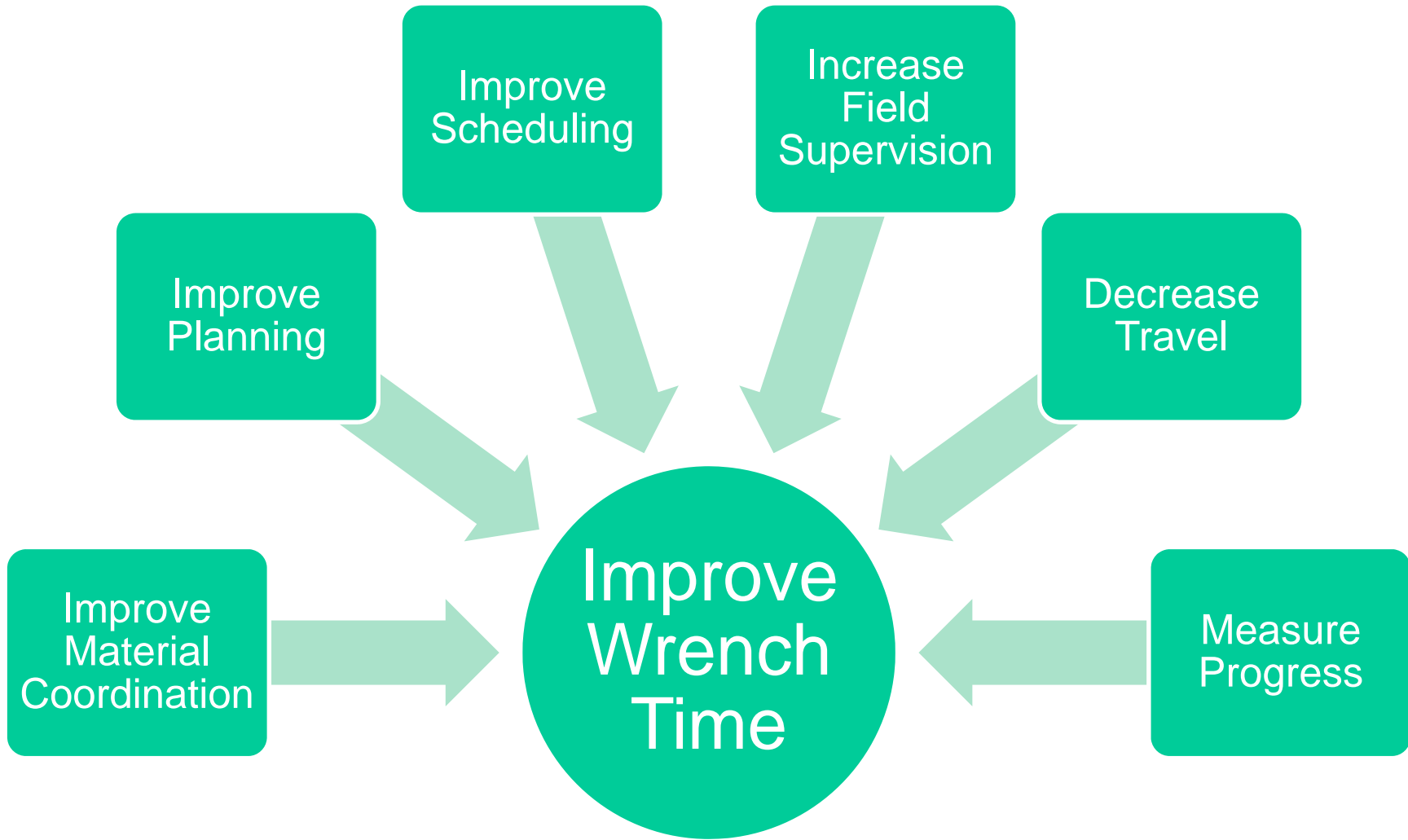


Improve Wrench Time

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Improve Wrench Time: Keys to Success

- Complex process to improve Wrench Time:
 - Improve Material Coordination
 - Improve Planning
 - Improve Scheduling
 - Increase Field Supervision
 - Decrease Travel
 - Measure Progress
- No singular change will increase wrench time



Each area of improvement has specific goals and an assigned manager to champion the actions

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Tools for Change

- **Improve Work Control (Planning and Scheduling)**
 - Developed Scheduler Desktop Guide
 - Determine and Implement:
 - Craft to Scheduler Ratio
 - Craft to Planner Ratio
 - Develop Planner Desktop Guide
 - Management Assessments
 - Improve Quality of Work Package Related Documentation

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Develop Scheduler Desktop Guide

- Requires weekly Scheduling Meetings (should occur at a routine, set time during each week)
- Meetings should be held with each crew
- Expect superintendent/supervisor to participate in meetings
- Scheduling should be based on priorities and location proximity when applicable
- Requires weekly Scheduling Reports

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Craft to Scheduler/Craft to Planner Ratios

- Utilized benchmark study of 10 entities for appropriate ratios
 - 1/50 for schedulers and 1/9 for planners
- Appropriate number of planners means:
 - More work into the hands of craft workers
 - Less false starts
 - Right parts, right permits, right guidance
- Appropriate number of schedulers means:
 - Support craft arrive appropriately
 - Work is ready when you are
 - Work is lined up allowing smooth transition from location to location

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Management Assessments

- Perform Management Assessments on both Schedulers and Planners to determine effectiveness and implementation of new guides
- Assessments will cover all areas of NSTec
- Visits to scheduling meetings and job walk downs
- Focus will be on how well planners/schedulers improve wrench time performance and adherence to the desktop guides

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Tools for Change

- **Improve Material Coordination**
 - Utilize central warehouses
 - Implement kitting and staging of material
 - Establish parts runner position
 - Establish rolling warehouse capability
 - Determine optimal requirements for craft vehicle assignments

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Tools for Change

- **Increase Supervision in the Field**

- Requires superintendents/supervisors to directly supervise craft personnel at their work location for a minimum of 2 hours per shift
- Available to remove barriers
- Ensure materials and tools are available and craft personnel have proper personal protective equipment prior to work being performed
- Respond to suggestions for improvement from craft personnel in a timely manner

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Tools for Change

- **Increase Supervision in the Field**
 - Make decisions at the floor level within NSTec processes and procedures to reduce downtime
 - Ensure craft personnel are working efficiently without impeding through a teamwork approach, encouraging their input without micromanagement
 - Communicate effectively with operations or other organizations to ensure work is adequately de-conflicted to prevent or minimize impacts

Tools for Change

- **Establish Key Measurement Tools**
 - Establish Key Metrics
 - Conduct Internal Wrench Time Studies

Key Metrics

- Need to measure key indicators to ensure changes are working
- FY 2009 Wrench Time Metrics:
 - Maintenance Backlog
 - Cycle Time of Work Orders
 - Quality of Work Packages
 - Estimate vs. Actual Hours
 - Pickups vs. Deliveries from Warehouse 160
 - Supervisor Time in Field
 - Scheduled vs. Performed Work Orders
 - Planning Backlog

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Conduct Internal Wrench Time Studies

- A minimum of four internal studies are planned prior to the FY 2009 independent study
 - Conducted Phase 1 study from October 20-23, 2008
 - Conducted Phase 2 study from January 12-15, 2009
 - Remaining 2 studies scheduled for March and May (may add more at request of managers)
- Use same data collection techniques utilized by independent company in 2007
- Seeing improvements in Wrench Time

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Define Success

- What defines success for this project:
 - Achieving 36% Wrench Time
 - The “norm” for daily work is achieved and defined as:
 - Travel to work site where multiple jobs have been scheduled for same building/area
 - Material available (previously kitted and staged); if additional material is needed, radio Warehouse to get Parts Runner to deliver necessary material
 - All support craft/organizations are scheduled and present to offer assistance
 - Supervision is available in the field to remove any barriers for success

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