Dryden Construction Safety

A Continuing Success Story

Twelve years without a lost time accident on any Dryden construction site

#1 Why we needed to *improve*…

August 28, 1997

- Compressed air pipe rupture, system repair During leak test, pipe was moved into trench while still pressurized
  - Release of air blasted sand & gravel across workers arms, chest, and abdomen
  - Abrasion to skin on arms, wearing safety glasses, no eye injury
  - Out for one day

#2 Why we needed to *improve*…

December 11, 1997

- Two personnel lifts tangled, hangar rehabilitation
  - Operator tethered with harness, did not fall to floor
  - Unconscious, broken sternum, facial injuries requiring surgery
  - Out for several weeks

#3 Why we needed to *improve*…

April 8, 1998

- Small personnel lift tipped over, hangar rehabilitation
  - While being moved to 2nd floor level, lift fell on a worker
  - Leg pinned under heavy weight, no broken bones, heavy swelling, some bleeding
  - Out for several days

#4 Why we needed to *improve*…

April 22, 1999

- Sheet metal in the wind, shop remodel
  - Wind forced material toward handler slicing arm
  - Out for one day

It was clear this had to stop.
We urgently needed to change.

Our Strategy

Goals

1. Send everyone home as healthy at they arrived
2. Eliminate injuries through accident prevention

Approach

1. Have strong safety requirements in our contracts
2. Conduct permit process for high risk activities
3. To create focus on accident prevention, use leadership and effective dialogue

Contract Requirements

- Daily Safety Meetings
- Daily Site Inspections
- Mandatory Hard Hats and Safety Shoes
- Site Specific Accident Prevention Plan
- Activity Hazard Analyses & MSDSs

- ➢ Specific DFRC Specification Section
- ➢ Commit to Annual Update

Permits for High Risk Activities

- Hot Work (grinding, flame, welding, etc)
- Digging (six inches or deeper)
- Utility outages (O&M manages all outages)
  - Lockout/Tag out
  - Energized work
- Confined Space
- Lifting and Cranes
  - Material delivery

National Aeronautics and Space Administration
Dryden Flight Research Center

Digging or Trenching?

Get a permit before you begin.

Why a permit?

To prevent hazards to employees.

To prevent damage to subsurface utilities.

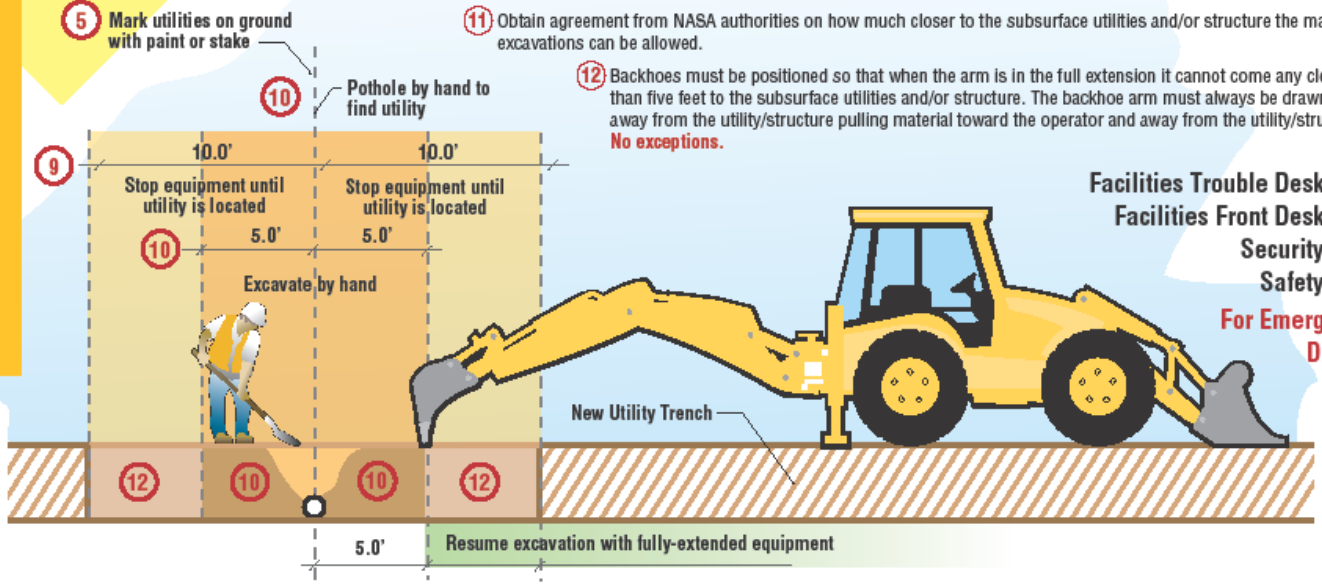
Avoid broken utilities!

This document developed in partnership by the Facilities Engineering and Asset Management Office (Code F) and the Safety and Mission Assurance Office (Code S).

Before starting any excavation, digging, trenching or ground penetration six inches or deeper, including driving stakes into the ground, follow these steps:

1. Write a Work Plan describing the work to be accomplished during the digging/ground penetration activities and include a schedule of the work. The schedule shall include the dates and time period the work will be performed.
2. Perform and write down the Activity Hazard Analysis of the proposed work to be accomplished during the digging/ground penetration activities. **Consider de-energizing active utilities.**
3. Initiate coordination with NASA by writing and submitting a request for a permit (a letter to NASA) for Excavation and Digging, and attach the Work Plan and Activity Hazard Analysis to the request.
4. Obtain current subsurface utility drawings (underground utility maps) of the particular area of work.
5. Stake out, mark, paint lines, or otherwise identify all subsurface utilities and structures.
6. Obtain agreement from NASA authorities that the stakes and markings are adequate.
7. Obtain the approved permit package.
8. Proceed in accordance with the approved permit package and requirements of contract.
9. Perform no powered equipment digging or machine excavation work (examples: backhoe, jackhammer, trencher, auger, etc.) within ten feet of subsurface utilities and/or structures, until utility is exposed.
10. Expose the subsurface utilities and structures by hand digging methods (pot holing) with pick, shovel, or water pressure-vacuum, with care. Powered equipment and machine excavations shall not be performed within five feet of subsurface utilities and/or structures. **No exceptions.**
11. Obtain agreement from NASA authorities on how much closer to the subsurface utilities and/or structure the machine excavations can be allowed.
12. Backhoes must be positioned so that when the arm is in the full extension it cannot come any closer than five feet to the subsurface utilities and/or structure. The backhoe arm must always be drawn away from the utility/structure pulling material toward the operator and away from the utility/structure. **No exceptions.**

Trench excavation at underground utilities



Facilities Trouble Desk x3865
Facilities Front Desk x3370
Security x3256
Safety x2300

For Emergencies Dial 911

Dialogue – Accident Prevention
Be Engaged, Focus on Safety, Everyday

- Chief conduct a weekly meeting with Engineers and Project Managers
  - MHA Meeting (Most Hazardous Activities)
  - Use a Checklist, ask about hazards
- Facility Project Managers and Inspectors attend daily safety meeting on the jobsite, conducted by superintendent
  - Today's activities – AHAs, MSDSs, Permits
  - Observations from yesterday – unsafe conditions, near misses
  - Hazards to be corrected – who, when, how
- Weekly Project status meetings – attended by C.O. and Safety Office
  - Cost , payments, changes
  - Quality: submittals, inspections, rework items,
  - Safety: permits, hazardous work, incidents, hazard correction
  - Schedule: milestones, look ahead
  - Communication: team issues, RFI status

MHA Agenda (weekly checklist)

- ❑ Elevated Work
- ❑ Flight Line Work
- ❑ Hangar Doors
- ❑ Hot Work, Welding
- ❑ Digging
- ❑ Cranes, Lifts
- ❑ Confined Space
- ❑ Roof Work
- ❑ Closures
- ❑ Outages
- ❑ Pressure System Work
- ❑ Substation Work
- ❑ Fire Protection Systems
- ❑ Heat Stress
- ❑ Cold Weather, Frost, Ice
- ❑ Asbestos, Lead Paint
- ❑ Preventive Maintenance Actions
- ❑ Predictive Testing
- ❑ Repairs
- ❑ Trouble Calls
- ❑ Service Calls
- ❑ Furniture Moves
- ❑ Emergency Responses
- ❑ Material Deliveries
- ❑ Material Disposal
- ❑ After Hour Call outs
- ❑ Design Reviews
- ❑ Major Facility Project Support
- ❑ Tripping Hazards
- ❑ House Cleaning

Goals Conversation

- Everyone goes home tonight as healthy as they arrived.
- The site is/will be kept free of recognizable hazards today.
- We have zero lost-time accidents here at Dryden.
- We have zero injuries on this job site.

Expectations:

Every single worker

…is expected to make this project safer.

…knows how to identify hazards.

…knows how to report hazards and get them fixed.

…understands his/her safety training needs…and is trained.

Dialogue on the Site

Dialogue after an Incident

- They might be afraid to tell you, in fear of ruining the record
- Leadership response is very important
  - ✓Handle the incident first, Is anyone hurt? 911? Have the responders been notified?
  - ✓Have all the right people been informed?
  - ✓Perform lessons learned, so that it doesn't happen again

Results as of May 9, 2011:

12 Years
18 Days
Without a Lost Time Accident
On a DFRC Construction Site