

NPOI Nitrogen Distribution Progress Report I

Amelia Fuller, Wyatt Huling, Scott Ryan

January 29, 1014

Presentation Contents

- Background information
- Changes to final design
- Prototype design
- Plan for building prototype
- Gantt Chart update
- Individual assignments
- Conclusion

Project Background

- Navy Precision Optical Interferometer
- Used to map stars
- Array telescope
 - 300 meter arms
 - Stations along arms utilized nitrogen devices
- Central nitrogen supply system needed

Changes to Final Design

- Manifold at imaging station (lizard head) replaced by barbed T-fitting
- Two tanks on each arm
 - Prior to gate valves (as in original design)
 - Prior to ninth imaging station (~200 meter)
- Pressure gauges along supply line

Prototype Design

- Small section of west arm
- Contains:
 - Imaging station
 - Astrometric hut
 - Gate valve section
- 100 ft section of supply tubing



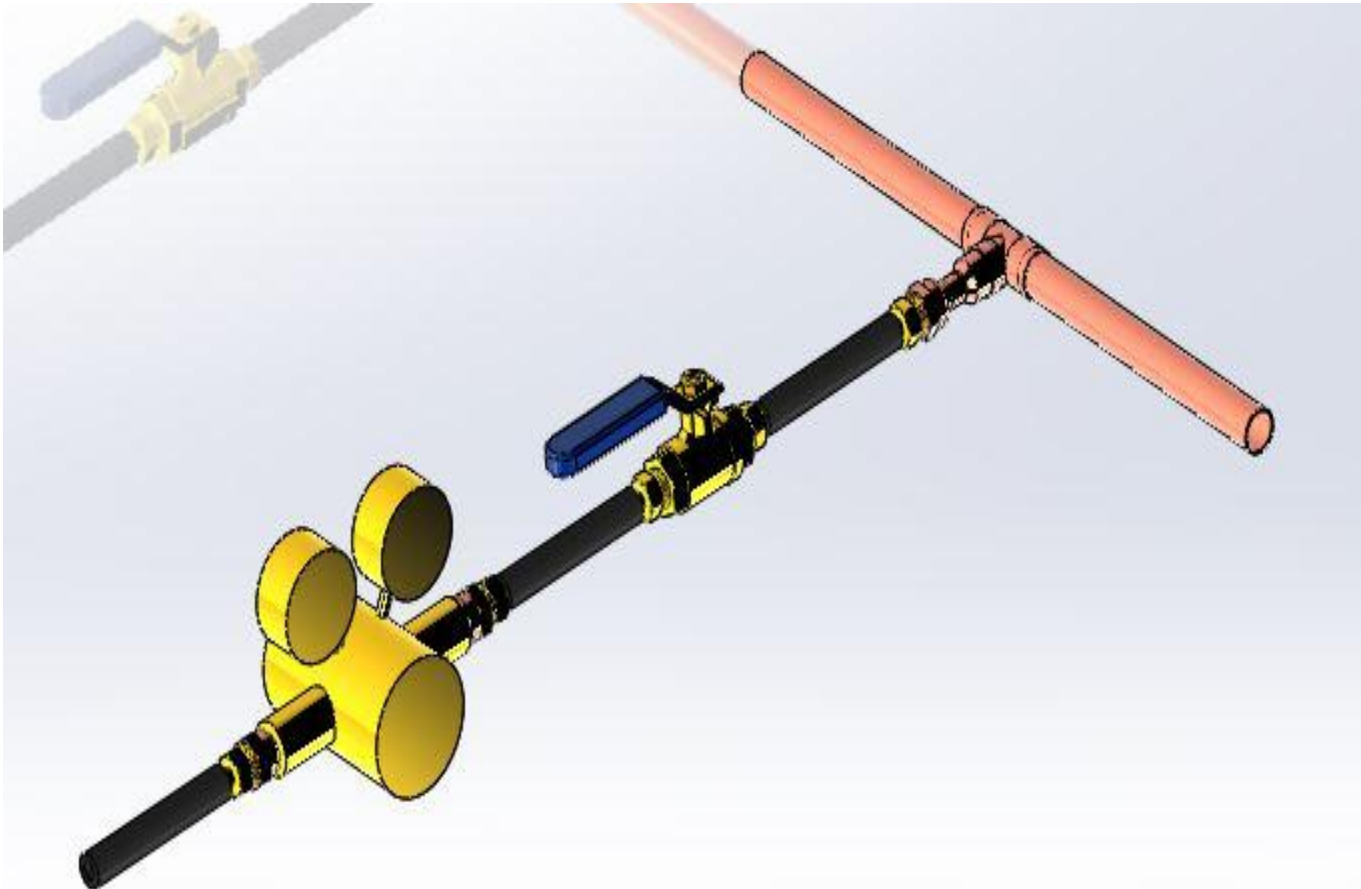
Changes to Prototype

- Dewar replaced by small tank
- Long coil to simulate length of arm
- Storage tank installed prior to gate valve
- Pressure gauge installed on each end of coil

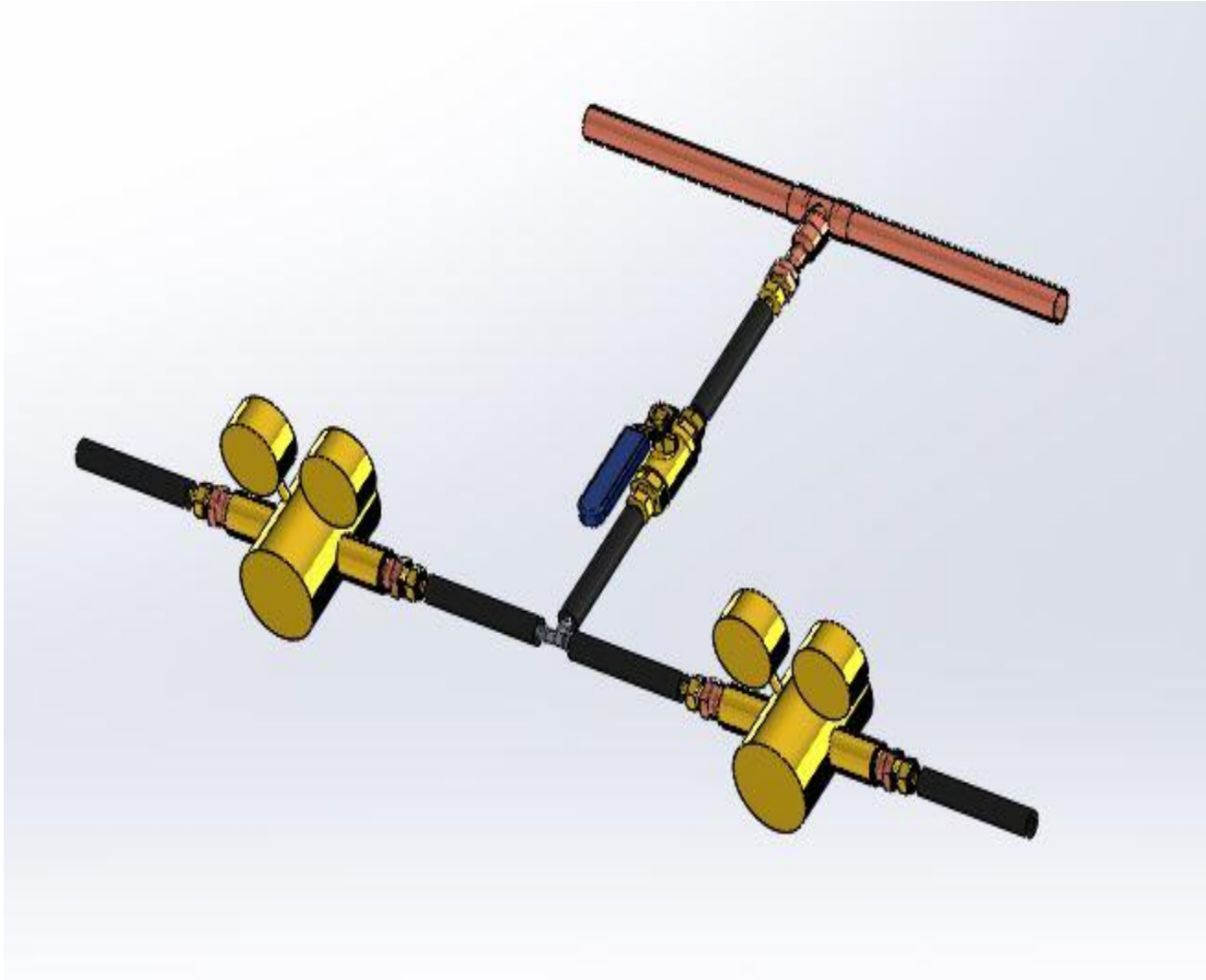
Astrometric Hut Design



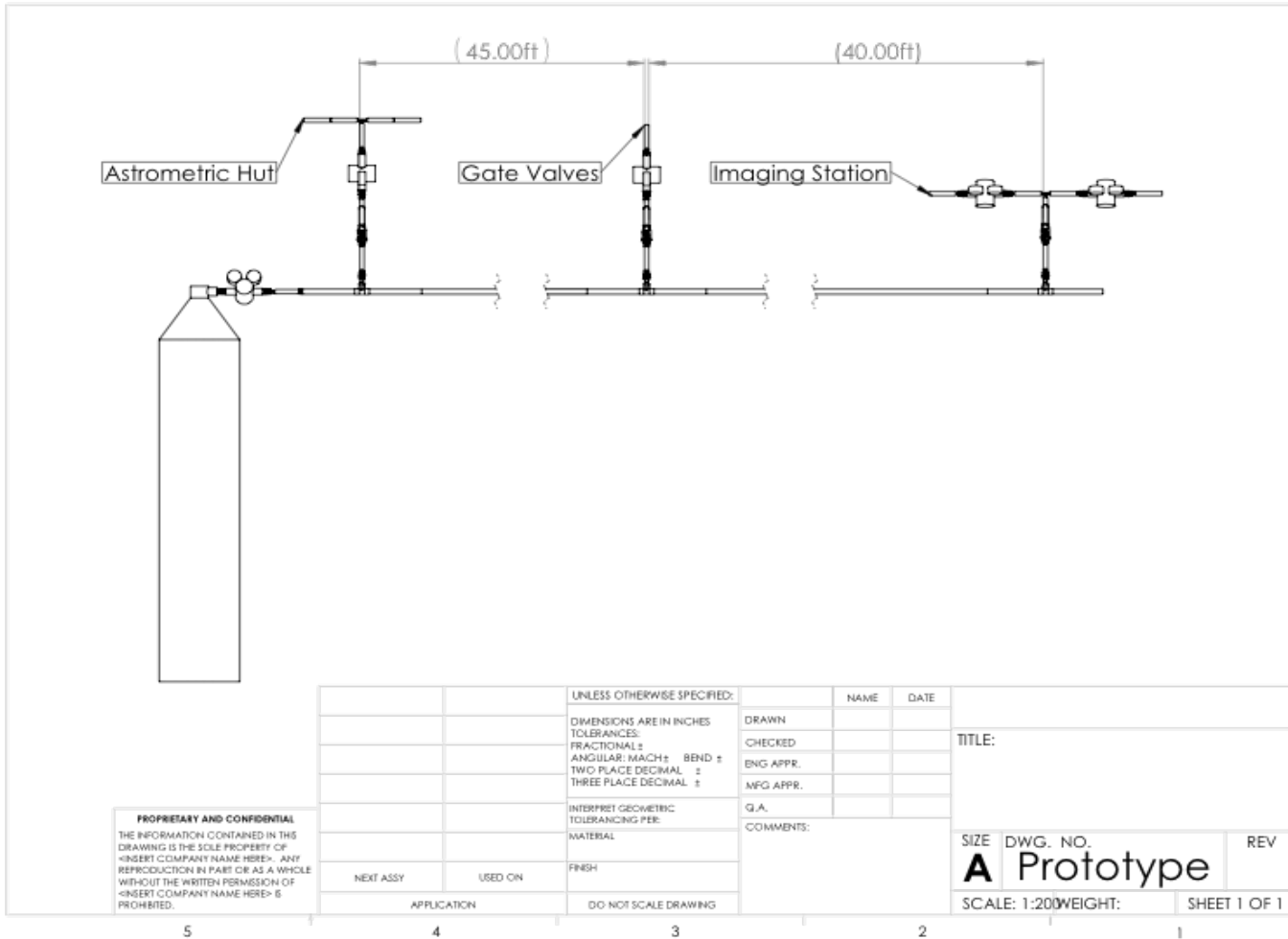
Gate Valve Design



Imaging Station Design



Prototype Design Drawing



PROPRIETARY AND CONFIDENTIAL
 THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF <INSERT COMPANY NAME HERE>. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF <INSERT COMPANY NAME HERE> IS PROHIBITED.

		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	
		DIMENSIONS ARE IN INCHES	DRAWN			TITLE:
		TOLERANCES:	CHECKED			
		FRACTIONAL: ±	ENG APPR.			
		ANGULAR: MACH ± BEND ±	MFG APPR.			
		TWO PLACE DECIMAL ±	Q.A.			SIZE DWG. NO. REV
		THREE PLACE DECIMAL ±	COMMENTS:			A Prototype
		INTERPRET GEOMETRIC TOLERANCING PER:				SCALE: 1:200 WEIGHT: SHEET 1 OF 1
		MATERIAL				
		FINISH				
	NEXT ASSY	USED ON				
	APPLICATION	DO NOT SCALE DRAWING				

5

4

3

2

1

Coil & Tank

- Coil installed prior to imaging station
 - Simulates actual distance of array
- Tank installed
 - At end of coil
 - Prior to gate valve
- PVC tubing to tank in-line with supply line

Plan for Building Prototype

- Sponsors must be on site for building
- Construction in order of application
 - Lay out main supply line
 - Includes tube bender
- Install brass fittings station by station
 - Includes cutting, soldering, installation
 - Install tanks, regulators and gauges
- Secure tubing to cable tray
- Charge system after final check

Prototype Cost

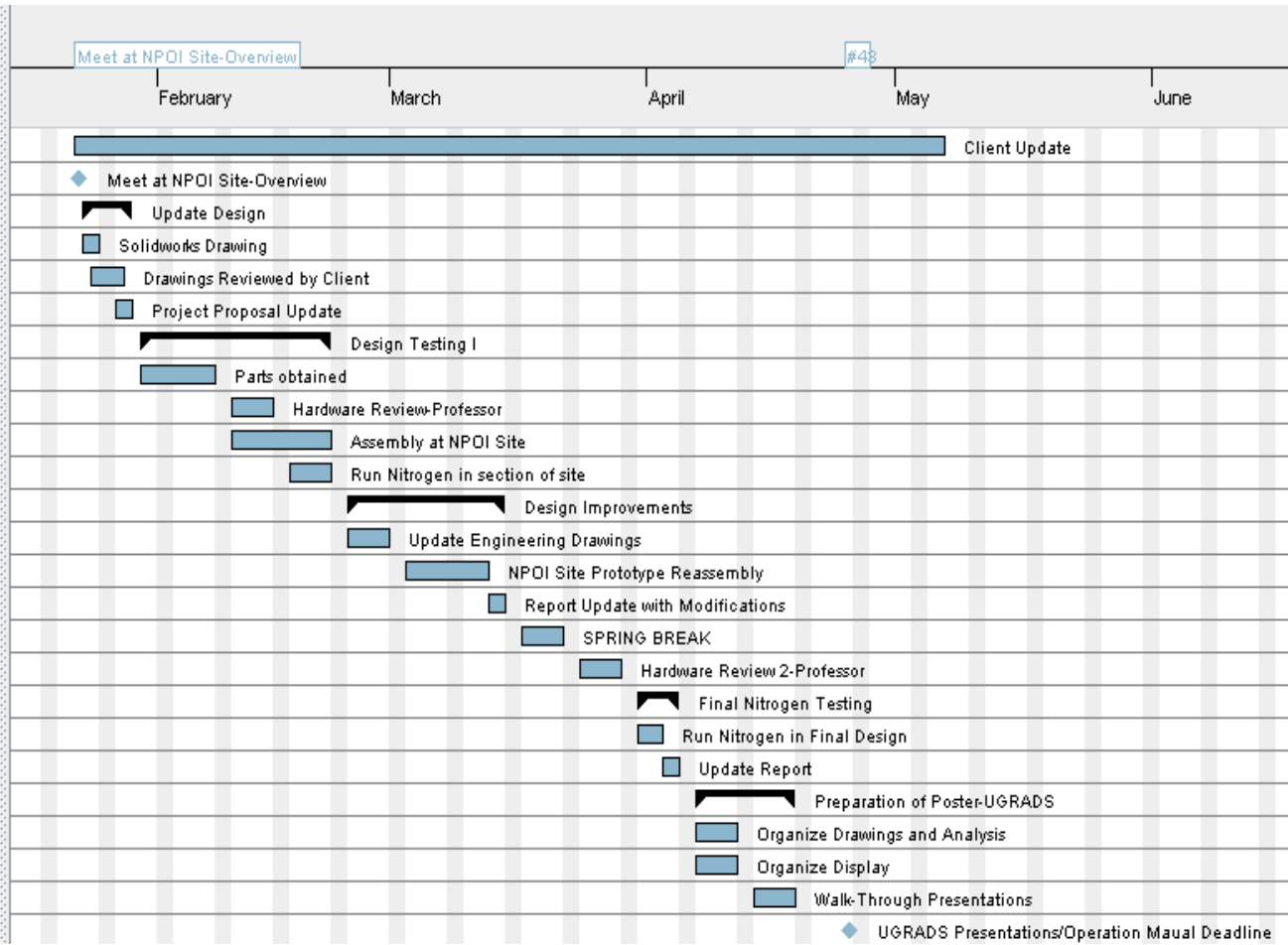
- Total cost: \$365.00 without coil
- Several components currently on site
 - Polyvinyl hose
 - 5 gallon tank
 - Tools
 - Manifolds

Gantt Chart Update



Name

- Client Update
- Meet at NPOI Site-Overview
- ♀ • Update Design
 - Solidworks Drawing
 - Drawings Reviewed by Client
 - Project Proposal Update
- ♀ • Design Testing I
 - Parts obtained
 - Hardware Review-Professor
 - Assembly at NPOI Site
 - Run Nitrogen in section of site
- ♀ • Design Improvements
 - Update Engineering Drawings
 - NPOI Site Prototype Reassembly
 - Report Update with Modifications
- SPRING BREAK
- Hardware Review 2-Professor
- ♀ • Final Nitrogen Testing
 - Run Nitrogen in Final Design
 - Update Report
- ♀ • Preparation of Poster-UGRADS
 - Organize Drawings and Analysis
 - Organize Display
 - Walk-Through Presentations
- UGRADS Presentations/Operation Maul Deadline ...



Individual Responsibilities on Site

Responsibility	Team Member
Schedule Planning	Amelia Fuller
Communication	Amelia Fuller
Logistics	Wyatt Huling
Supplies	Wyatt Huling
Documentation	Scott Ryan
Building	Scott Ryan

Conclusion

- A central supply system is needed for nitrogen distribution at the NPOI.
- Minor Changes have been made to the design:
 - Manifold at imaging station replaced with T-fitting.
 - Two tanks per arm.
 - Pressure gauges installed throughout system.
- Prototype will be built on site and consists of one of every device utilized at facility.
- A coil will be employed to simulate distance of array arm.
- Each team member will be in charge of aspects of the build.