

Team 520 Spring Project Plan

Goals and Objectives

Several goals have been set forth by Team 520 to ensure successful completion of the actively sealed cryogenic coupler project as determined by the needs and requirements from the sponsor, NASA - Marshall Space Flight Center. The upcoming spring semester will be the period of the project where plans come to action regarding the chosen design and testing. Specifically, the team anticipates difficulty in the machining and manufacturing of the coupler, and so will seek to begin the process in collaboration with the FAMU-FSU College of Engineering machine shop as soon as possible. Due to the hazards associated with cryogenic liquid nitrogen, to perform testing of the coupler the team will be required to receive the appropriate training and clearance from the MagLab. Overall, in the coming spring semester, the major goals for Team 520 and the actively sealed cryogenic coupler project are to order necessary parts and materials, begin machining and manufacturing process, test the coupler at the maglab, refine design and implement any changes deemed necessary, complete final tests of the coupler, and finally present the results of the project on Senior Design Day. For more specific goals along with their associated desired completion dates, see the table below.

Milestones

Milestone	Deliverables	Date
Sponsor Meeting	<ul style="list-style-type: none">• Discuss state of design• Confirm materials selection	1/5
Machine Shop Meeting	<ul style="list-style-type: none">• Meet with a machinist to determine necessary changes for design	1/8-1/12

	<ul style="list-style-type: none"> • Discuss assembly methods for second prototype and final design 	
Order Materials	<ul style="list-style-type: none"> • Order necessary materials through authorized vendor 	1/15-1/19
Prototype 2	<ul style="list-style-type: none"> • Create updated design incorporating seals and insulation • 3D print and assemble prototype 	1/22-1/26
NHMFL Contact	<ul style="list-style-type: none"> • Confirm LN2 testing and any prerequisites to complete before training begins 	1/26
Ambient Water Testing	<ul style="list-style-type: none"> • Conduct ambient water testing on second prototype • Account for operational environment using Environmental Correction Factor (ECF) 	1/29-2/1
Sponsor Meeting	<ul style="list-style-type: none"> • Discuss state of design and results of ambient water testing 	2/2
Machine Shop Meeting	<ul style="list-style-type: none"> • Meet with machine shop to discuss requirements for engineering drawings and possible design improvements 	2/5-2/7
Complete NHMFL Safety Training	<ul style="list-style-type: none"> • Meet with our principal investigator (PI) to begin NHMFL safety training 	2/7-2/12

	<ul style="list-style-type: none"> • Determine required design changes to fit existing cryostat pipes 	
Finalize Design	<ul style="list-style-type: none"> • Modify design based on results of ambient water testing and feedback from sponsor • Create technical drawings for each part 	2/12-2/22
Sponsor Meeting	<ul style="list-style-type: none"> • Review final design • Discuss cryogenic testing procedures 	2/23
Manufacture Parts	<ul style="list-style-type: none"> • Give materials and drawings to machine shop for manufacturing 	2/26-3/8
Assemble Final Design	<ul style="list-style-type: none"> • Assemble final design in Senior Design Lab using machined parts, seals, and springs 	3/11-3/15
Cryogenic Testing	<ul style="list-style-type: none"> • Test our final design at the MagLab assuming training is completed at this point • Use liquid nitrogen as our cryogenic test fluid 	3/18-3/22
Prepare for Design Day	<ul style="list-style-type: none"> • Update poster based on recommendations made during VDR3 	3/25-3/30

	<ul style="list-style-type: none"> • Create website showcasing design and documentation • Produce physical model showing cross-sectional view for demonstration 	
Engineering Design Day	<ul style="list-style-type: none"> • Arrive early to set up • Present poster and final design 	4/1
Finals Week	<ul style="list-style-type: none"> • Study and arrive on time to exams • Pass 	4/29-5/3
Graduation	<ul style="list-style-type: none"> • Enjoy time with family • Don't trip on stage 	5/3