

Hazard Analysis

Work Package # 30221 - Test of Mass Flow Controller
Hazard Analysis - Form 2023-22244

Dates 30-MAR-2023 — 30-MAR-2023

Managed By PPD — Particle Physics Division

Performed On Particle Physics Division

Authorizing Supervisor Tesarek, Rick (12680N) 630.840.8609

Project Name E1039

Prepared By Nakano, Kenichi (14489V) 630.840.

Job Description Test basic functions of mass flow controllers with a temporary setup. A mass flow controller to be tested is Teledyne Hastings HFC-D-303A. An interface device such as THCD-400 is used together. Helium or Nitrogen gas is used, where we need Helium gas when checking the accuracy of the gas flow reading.

Workflow Status **Approved**

Comments I approve this on condition that the regulator/relief assembly includes a relief valve that relieves at 10psig.

Point of Contact _____

Pre-job Briefing Conducted by _____

Package Location

Type	Name	Building Manager	Org
Property	KTeV / NM4 [630]	AFM: (Huey, Steve) TL: (Nelson, Leonard)	PPD

Hazard Analysis

Check the MS Equipment Database for equipment you can use to complete your job: ([MS Equipment DB](#))

Check out questions that should be used when job planning or conducting pre-job briefing: ([Job Planning/Pre-Job Brief Questions](#))

Emergency Work

Check this box to indicate this is emergency work that is required to be done immediately before electronic approvals can be obtained. (NOTE: Electronic approvals should still be obtained retroactively.)

Additional Details

Check the boxes next to all types of work and known hazards you may encounter on this job.

COVID-19 Protective Measures ([Guidance Documents](#))

- Maintain 6 ft. or greater social distance when possible
- Surgical Mask or other Lab-approved Mask
- Face Shield
- Safety Glasses / Goggles
- Impervious Gloves
- Clean Surfaces Used
- Wash/Sanitize Hands
- Other Protective Measures Not Listed Above (List in Text Box below)

Close Proximity Work < 6 feet

- 1. Check this box to select the D/S personnel performing the close proximity work (check ALL that apply)
- 2. Check this box to select where the close proximity work will be performed (check ALL that apply).

Industrial Hazards

- Flammable Gas Areas
- Heat Stress / Cold Stress
- Structural Demolition
- Excavation
- Scaffold Erection
- Scaffold Use
- Ladder Use
- Steel Erection
- Fall Protection - Fall Exposures >4 feet (>6 feet for construction)

- Overhead Crane
- Powered Industrial Truck (e.g. forklift)
- Mobile Elevating Work Platform (MEWP) (e.g. Scissor Lift, Aerial Lift, Bucket Truck, etc.)
- Mobile Crane (Complete eJulie Prior to Setting up Crane)
- Below-the-Hook Lifting Device
- Critical Crane Lift
- Crane Personnel Basket
- Rotating Equipment
- High Pressure air/fluids
- Welding/Cutting/Brazing/Grinding
- Lead (Lead paint, moving bricks, cutting sheets, soldering)
- Chemical Use (cleaners, solvents, adhesives, etc.) - If checked attach or link SDS to the HA
- [Upload Files](#) [Add Hyperlinks](#)
- Lasers
- Non-ionizing radiation (RF, UV, magnets)
- Confined Space
- Ergonomics (overexertion, repetition, heavy lifting, awkward lifting, static posture)
- Silica (machining - concrete, asphalt, grout, mortar)
- Loud Noise (continuous, instantaneous)
- Asbestos (presumed or suspect building materials, e.g. tile, pipe insulation, roofing materials, etc.)
- Nanomaterial (1-100nm, ex. buffing solutions, surface material coating, 3d printing)
- Beryllium
- Potential Oxygen Deficiency - ODH 1 or ODH 2 Area
- Robotics

Electrical Hazards

- Manipulative Energized Work
- Diagnostic Energized Work (inc. LOTO verification)
- Working within 25 feet of 345kV overhead utilities
- Working within 10 feet of overhead utilities

Environmental Hazards

- Impact or release to surface, sanitary, or ground water
- Impact to new or existing air emission sources, including equipment/generators
- Generation of regulated waste (hazardous, special, universal)
- Use of refrigerants (NOTE: Refrigerant work must be performed by an EPA certified technician and coordinated through the FESS Refrigerant Manager.)
- Use of Oil (> 55 gal) or new oil filled equipment
- Release of a chemical or use of a new chemical
- Impact to a naturally sensitive area or historical site

Radiation Safety

- Posted Radiological Area (Radiation Area, HRA, Contamination, Airborne)
- Radioactive Material, Ionizing Radiation, Radiation Sources, RGDs, RAW systems, Exhaust Systems, Beamline Components - including targets & absorbers
- Area working in ≥ 100 mrem/hr

- Worker receiving ≥ 50 mrem for the job

General Hazards

- Traffic Control
 Working above others
 Biological Hazards
 Other Hazards not listed here? Enter them in the text box below.

Check the boxes next to all types of PPE and Controls you will need for this job.

Personal Protective Equipment (PPE)

- Hardhat
 Bump cap
 Steel-toed boots
 Steel-toed shoes
 Gloves - leather
 Gloves - chemical
 Gloves - electrical
 High visibility clothing
 Gloves - Cryogenic
 Gloves - Nitrile
 Safety Glasses
 Safety goggles
 Safety goggles - chemical
 Safety goggles - impact/face shield
 Welding goggles/helmet
 Fall Protection
 Respirators (air purifying), cartridge
 Respirators - supplied air
 Long Sleeve Shirts
 Long Pants without Cuffs
 Arm - cut protection
 Leg - cut protection
 Apron - Cryogenic
 Whole body - electrical
 Whole body - Dust, chemical, heat
 Tyvek Coveralls
 Tyvek Boot Covers
 Earmuffs (enter noise reduction rating (NRR) in text box below)
 Ear Plugs (enter noise reduction rating (NRR) in text box below)
 Other PPE not listed here? Enter them in the text box below.

Controls

- Danger tape & signage
- Orange Construction Fence / Snow Fence
- Barricades - solid
- Barricades - soft (caution tape)
- Soil/erosion control
- Road Closure
- Site dust control
- Other Controls not listed here? Enter them in the text box below.

Hazard / Mitigation

Step #	Critical Step	Process Step	Hazard Details	Mitigation Details
1	No	Connect a pressure regulator to a compressed gas cylinder.	N/A	N/A
2	No	Connect a pressure relief valve to the pressure regulator.	N/A	N/A
3	No	Connect a mass flow controller to the gas system. Two or more controllers may be connected when the gas flow is compared between them.	N/A	N/A
4	No	Connect the mass flow controller to the interface device via an electrical cable.	N/A	N/A
5	No	Turn on the interface device.	N/A	N/A
6	No	Set the mode and set point of the mass flow controller to CLOSE and 0 SLM.	N/A	N/A
7	No	Make sure that the gas regulator is fully closed.	N/A	N/A
8	No	Open the hand valve of the gas cylinder.	N/A	N/A
9	No	Increase the pressure of the gas regulator to 5 psi.	The downstream of the gas regulator could be over-pressurized.	The pressure relief valve prevents it.
10	No	Change the mass flow controller to the AUTO mode and increase the set point step-by-step.	N/A	N/A

11	No	Set the mode and set point of the mass flow controller to CLOSE and 0 SLM.	N/A	N/A
12	No	Close the hand valve of the gas cylinder.	N/A	N/A
13	No	Disassemble the gas system.	N/A	N/A

Workflow | State Complete | Outcome Approved

Workflow Tasks

Role	State	Submitted	Responder	Comments	Responded	Outcome
Start Notification	Complete	26-MAR-2023 20:55			26-MAR-2023 20:55	Notified
Supervisor 12680N	Complete	26-MAR-2023 20:55	Tesarek, Rick	I approve this HA on the condition that the regulator/relief valve assembly includes a relief valve that relieves at 10psig.	28-MAR-2023 08:15	Approved
Notify	Complete	28-MAR-2023 08:16			28-MAR-2023 08:16	Notified

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ENERGY

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Fermi National Accelerator Laboratory

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Pre-job Briefing Conducted by _____

The tasks have been reviewed in the work area where they will be performed, and the workers on this crew have been through required training.

NAME and ID (Please Print)	Signature	Date