Summary of HDIce requirements related to LHe and the CTF refrigerator, as of July 11, 2014

-------- Original Message --------
Subject: Re: cooling capacity required for HDIce.
Date: Mon, 19 May 2014 15:36:11 -0400 (EDT)
From: Michael Lowry <mlowry@jlab.org>
To: John Hansknecht <hansknec@jlab.org>
CC:mlowry@jlab.org, poelker@jlab.org

John,
Our usage while in Hall B attached to a 500 ltr buffer dewar fed by the ESR was as high as 0.55 grams/sec. Hopefully our new vapor shielded transfer line will reduce that significantly but we will have to see.
Mike Lowry

----- Original Message -----
From: "John Hansknecht" <hansknec@jlab.org>
To: "Michael Lowry" <mlowry@jlab.org>
Cc: "Matt Poelker" <poelker@jlab.org>
Sent: Monday, May 19, 2014 3:01:23 PM
Subject: cooling capacity required for HDIce.

Mike,

They tell me you are the person to ask. I am trying to figure out what the anticipated loads are that we (injector group and HDIce) will need the cryo group to provide during the test lab operations. I understand that your target can be filled and maintained by dewars, but you would prefer to get cryogens from the CTF. Correct? Grams/second?

Thanks,

John

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Joe Gubeli met with Kelly Dixon and some questions arose:

1) Is the LHe 0.55 grams/sec for HDIce an average or peak flow rate?
2) Is 3 ATM OK for the LHe supply to HDIce?
3) What is the return He gas pressure from HDIce?
4) From Kelly, “We need to know who will be responsible for venting the helium during upset conditions--just like the FEL CM where the parallel plate blows into the room and the small circle seal relief valve into our guard vacuum header? “

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Matt,
Here's a response to your questions:

1) 0.55 gm/s = 380 LHe/d was the average rate of usage in Hall B; peak was not much higher. We do hope to incorporate improvements that will lower this rate (eg. a better transfer line), but these are untested.

2) Question 2 suggests "3 atm of LHe". We presume this is actually 3 atm of cold gas not liquid. We are assuming a supply of liquid, not gas, so we presume the existence of a buffer dewar with a JT valve that liquefies this cold gas supply. (There was such a dewar in Hall B, but it is not available.)

3) Our return He pressure is the output of our bellows pumps; the pressure should be above atmosphere to avoid leak issues, maybe about 1100 mb, but less than 1400 mb, at which point various relief valves open.

4) As to where helium gas goes in the event of a sudden release (eg. a vacuum loss to a cryostat), there are various ways of dealing with this, but it's up to Carol Jones who is worrying about air flow. At some point several of us should sit with him to make sure he know what he is dealing with.

Hope this help,...Andy