

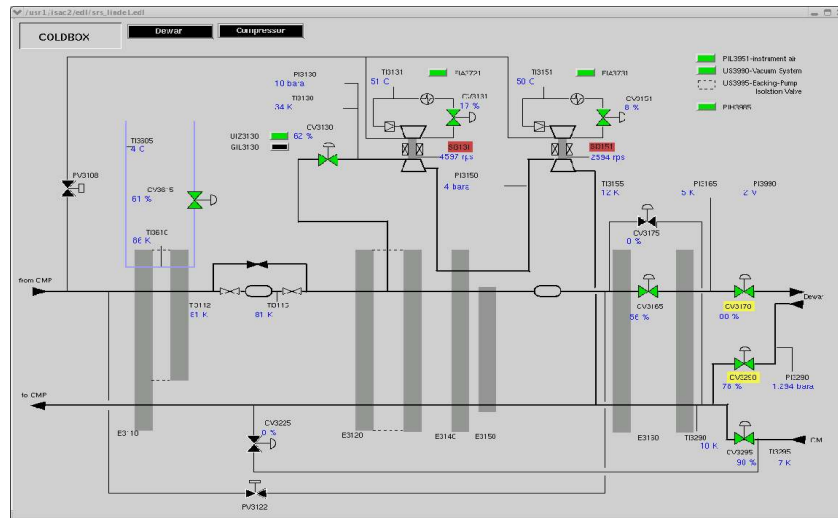
ISAC-II Cryogenics Emergencies

(Based on training notes on ISAC-II, Version 1.2, November 11, 2010)

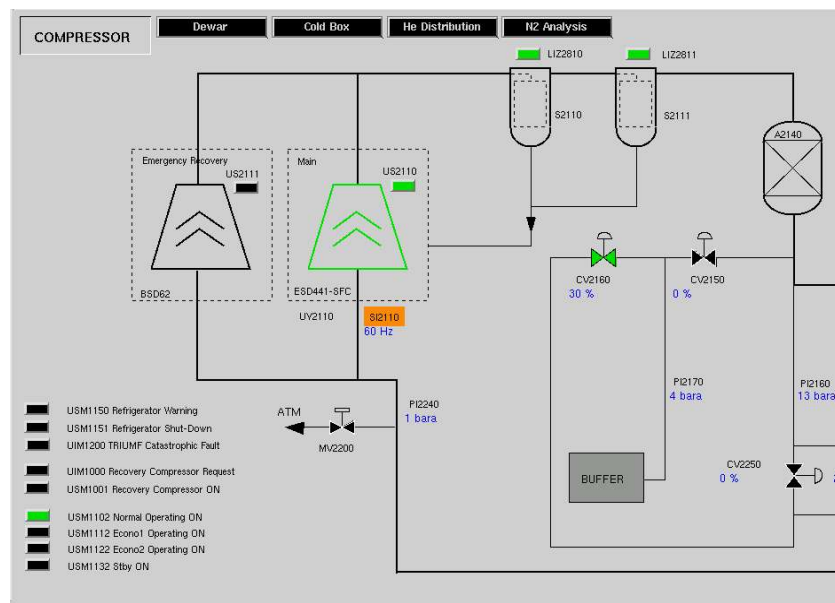
Note: An ISAC-II cryogenics compressor trip, especially when not accompanied with other symptoms (except, likely, an EF-12/13 switchover), may not be the result of a power bump or outage, but may just be the result of a loss of site (compressed) air.

Cold Box Trip:

How to diagnose: Expansion turbines will spin down, as indicated by Linde variables SI3131 and SI3151 (in the coldbox EPICS page, see red boxes below), and valves, CV3170 and CV3290 (yellow boxes), will close to isolate the refrigerator from the dewars.



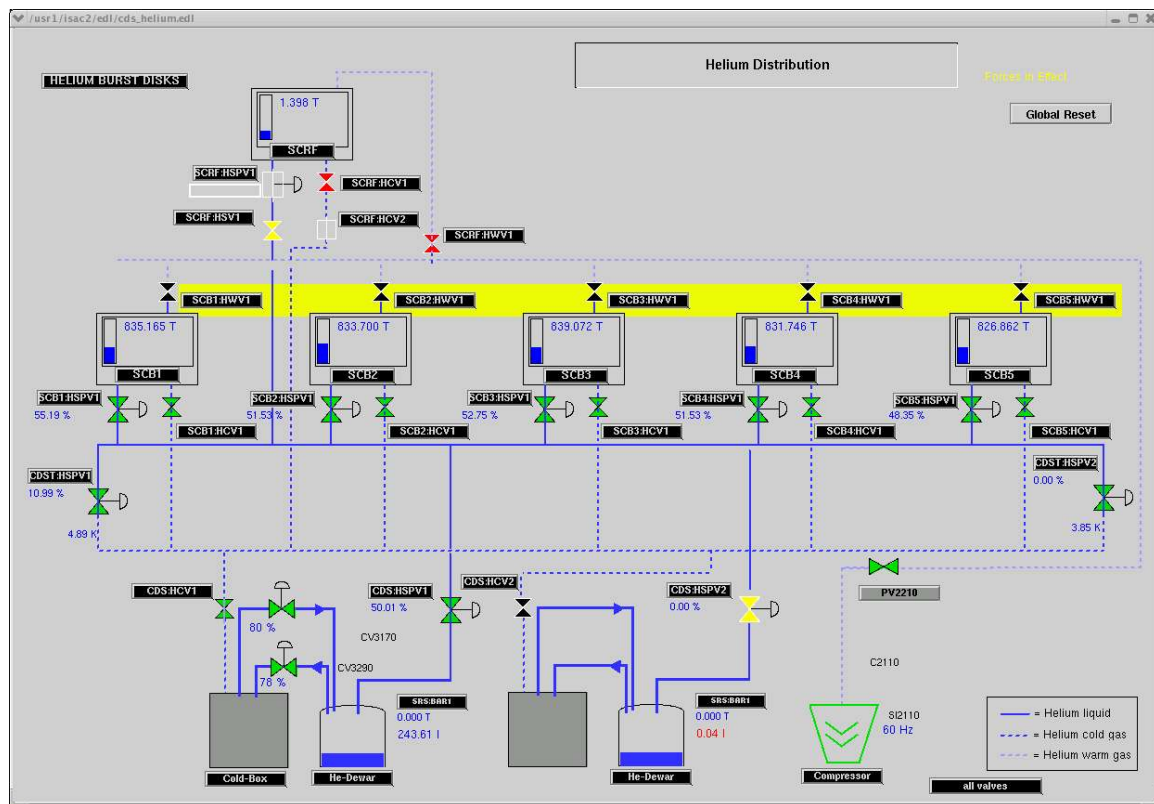
Action: 1. Check if main compressor is on (SI2110) (orange box).



- If not, proceed with turning on the recovery compressor (see compressor trip recovery).
- Go to Refrigerator Room (room 164, beside the S-Bend) and inspect the Linde control panel.
 - Clear the warning message on the front panel by pressing the “Acknowledge” key – you may have to clear it a few times.
 - Press “Restart” (K10) key on the front panel.
 - Press “K5” key on the front panel to start the cold box.
 - Phone expert 24/7. (See end of document.)

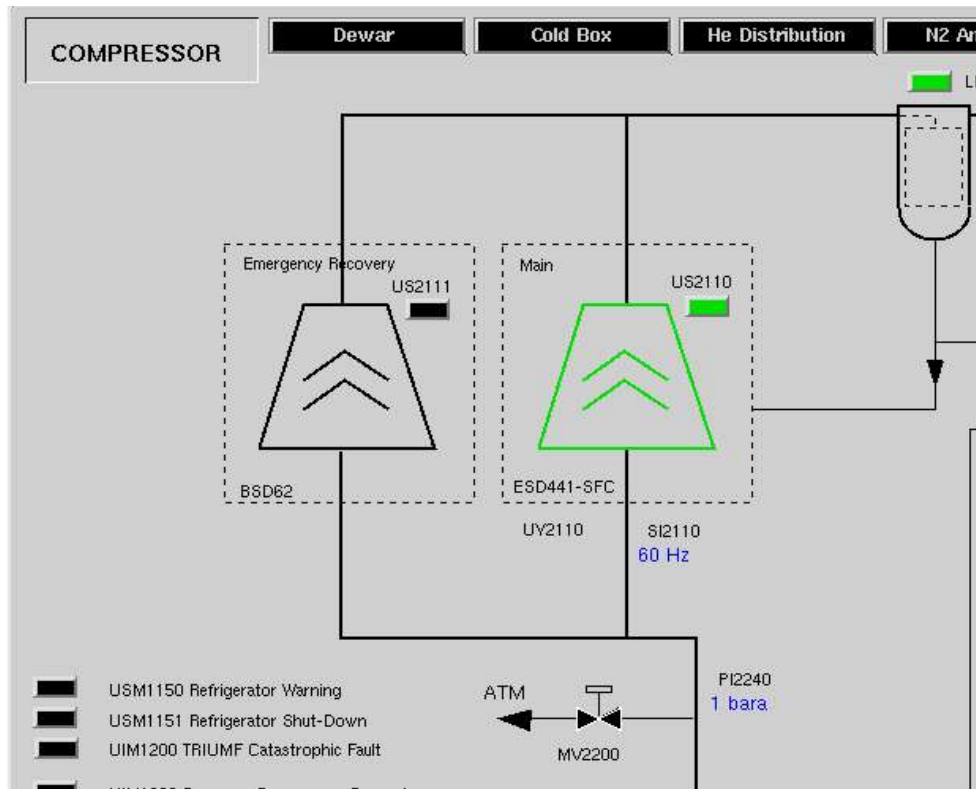
Compressor Trip:

- Whenever the helium refrigerator shuts down due to a refrigerator trip, or the main compressor shuts down (compressor trip, power bumps, or power outage), look at the “Helium Distribution” EPICS page to look at the status of the warm return valves (yellow box, below).

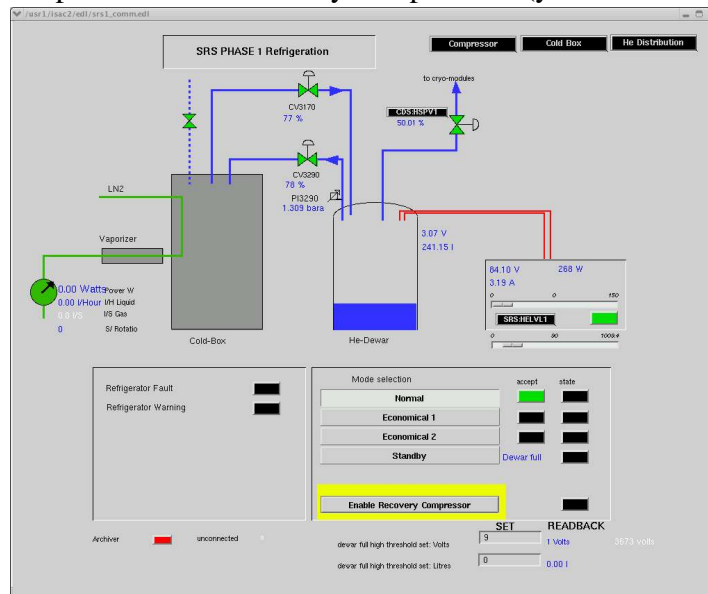


All warm valves should be open and the supplies should be closed. Even if some warm valves are closed, continue to the next step, but note that a burst disc may have vented into the vault. See the helium distribution page or CDS vacuum page to see all possible warning messages. Note that the pressure in the helium space may be rising quickly (normal is 830 Torr, but you may see >1000 Torr).

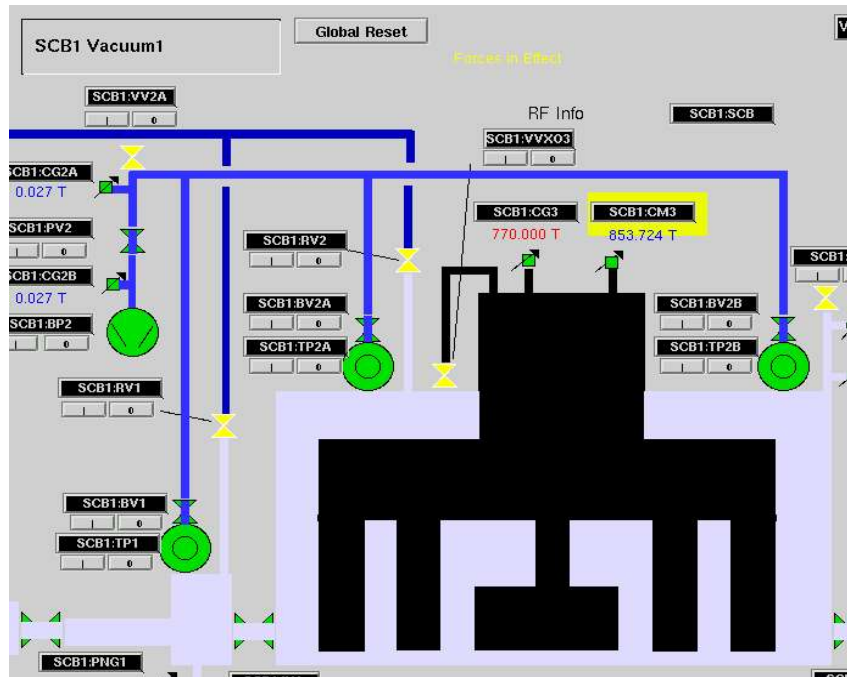
2. Look at the “Compressor” EPICS page. If the main compressor is coloured sturdy green, and SI2110 is steady and ≥ 29 Hz, then contact a system expert. (Note that standard compressor speeds are 29Hz (standby), 35Hz (ECO2), 42Hz (ECO1), and 60Hz (normal).)



3. Look at the “SRS Phase 1 Refrigeration” page (on EPICS: Cold Distribution -> SRS -> Phase I Dewar), and press “enable recovery compressor” (yellow box below).



4. Wait five seconds, and check the compressor page for the recovery compressor (to the left of the main compressor on the EPICS diagram) to turn green. If not, try the enable one more time, wait five seconds, and check again.
5. Go to the refrigerator room (room 164) and inspect the Linde control panel.
6. Clear the warning messages on the front panel by pressing the “acknowledge” key - you may have to do it several times.
7. Press the “Restart” (K10) key on the front panel.
8. Check the “K4” button on the panel.
 - If flashing green, it means the recovery processor has started.
 - If blank, then press, and wait for the light to the right of the button to flash (turn green).
 - Check the EPICS compressor page for the recovery processor status. At least one of the compressors should be running (coloured green). If not, return to step 3.
 - On the EPICS SCBx:Vacuum page, note the helium pressure with SCBx:CM3 (yellow box below). When the recovery processor is properly on, this pressure should reduce to values <900 Torr.



9. If this is a full power outage, and the diesel generator will start, then allow the diesel to start and then run stable for one minute. Do not allow the diesel to stop. If the diesel is not going to start, **immediately** notify Franco Mammarella or Curtis Ballard that the diesel generator has failed to start, or we may lose a significant amount of liquid helium.

10. Go to the ISAC-2 helium compressor building. Note that helium gas may be blowing off occasionally through the overpressure protection valve, MV2200.
11. Go to the recovery compressor panel and press the “ESC” button.
12. Then press “A” in the image on the right several times until the LED at “B” goes out, then press “C” (“enable”) five times. Then press “D” to start:



13. Even if the above “enable” button has not lighted, continue to the next step.
14. Go to the refrigeration/cryogenics room (room 164). Go to the blue LINDE control panel. Push “ESC”, then push the yellow “ACK” button, and repeat until the LED on the button goes out. Then press “RESET” (K10) and repeat until the K10 LED goes out and stays off. Move to the Keith's work station, and move the mouse, and return to step 3.
15. Contact system expert. (See end of document.)
16. If running on diesel-generated power, the recovery compressor will trip when the mains power is restored and the diesel is turned off. When this happens, return to step 3.
17. Monitor the “Compressor” EPICS panel and the Helium Distribution Panel. At least one of the compressors should be running (coloured green). If not, return to step 3.

System Experts:

Area	Name	Local	Home Number	Pager
Cryogenics	David Kishi	6274	604-320-1241 604-418-8961 (cell)	604-291-1318
Cryogenics	Kevin Trithardt	6277	604-451-0224	604-645-0049
Cryogenics	Alexey Koveshnikov	7381	604-447-2871	
General	Bob Laxdal	7322	604-324-2410	604-205-3599
Diesel Generator	Franco Mammarella	7412	604-272-2734	
Diesel Generator	Curtis Ballard	6201 / 7677		604-645-0782