**Project: GIF++**

**WP1: Fixed Gas Pipe Network at the GIF++ (SPS North Area, ENH1 Hall, H4 Beam Line)**

**URL: http://cern.ch/WP7/GIF\_Objectives.htm**

Version 1, 24/8/09

The GIF++ will be equipped with gas supply and some gas mixing, distribution and analysis systems as generic as possible. They will available to the groups testing detectors in this facility.

The GIF++ gas system infrastructure has been divided in parts:

1. Primary gas supplies outside the ENH1 hall (Dewars, batteries or individual gas cylinders)
2. Supply lines between primary supplies and the GIF bunker, at pressure below 10 bar;
3. Mixing racks, distribution racks and gas analysis in the so-called ‘GIF++ gas area’ in the proximity of the GIF++ bunker;
4. Distribution pipes from the ‘GIF++ gas area’ to the bunker, and their return.

This WP deals solely with point 2: the fixed pipe network between the gas supply area (outside the hall) and the fenced GIF++ gas area in the proximity of the bunker. The distance between these two areas is about 100 m. The pipes between racks and chambers and their return shall be responsibility of the different detectors owners due to the diverse requirements in terms of pipe materials, length and diameter. Trays at height will be provided to lay those pipes.

The gas network needed in the facility must include:

* Up to 12 different supply pipes. Gases included are: Ar, N2, CO2, He, Xe, CF4, C2H2F4, iC4H10, SF6.
* 4 lines for premixed gases.
* 2 common exhaust lines (under-pressure and purged).

The pipe network should be made of cleaned stainless steel 316L pipes of minimum 12/10 mm diameter, joined with TIG welded and proper Swagelok/Sagana type connections when needed.

Pipes should arrive to distribution wall-panels with pressure regulation (<0-10 bar) and fan out.

To monitor efficiently the status of supplies and users consumption, primary gas flows should be measured using electronic mass flow controllers.

Heated pipes from the gas supply area to the GIF++ rack area for isobutane and Freon are needed.

Typical length of all these pipes will be around 100 m.

For information, certified oil-free stainless steel pipes (ISO 1127; 316L Cold-drawn, seamless, annealed, pickled, bright, 12/10 mm outer/inner diameter) cost 12 CHF/meter. This price does not include their installation.