



Two half-day seminar on the remaining work packages to complete the MEDICIS Facility – 2 March 2016

MEDICIS Ventilation System

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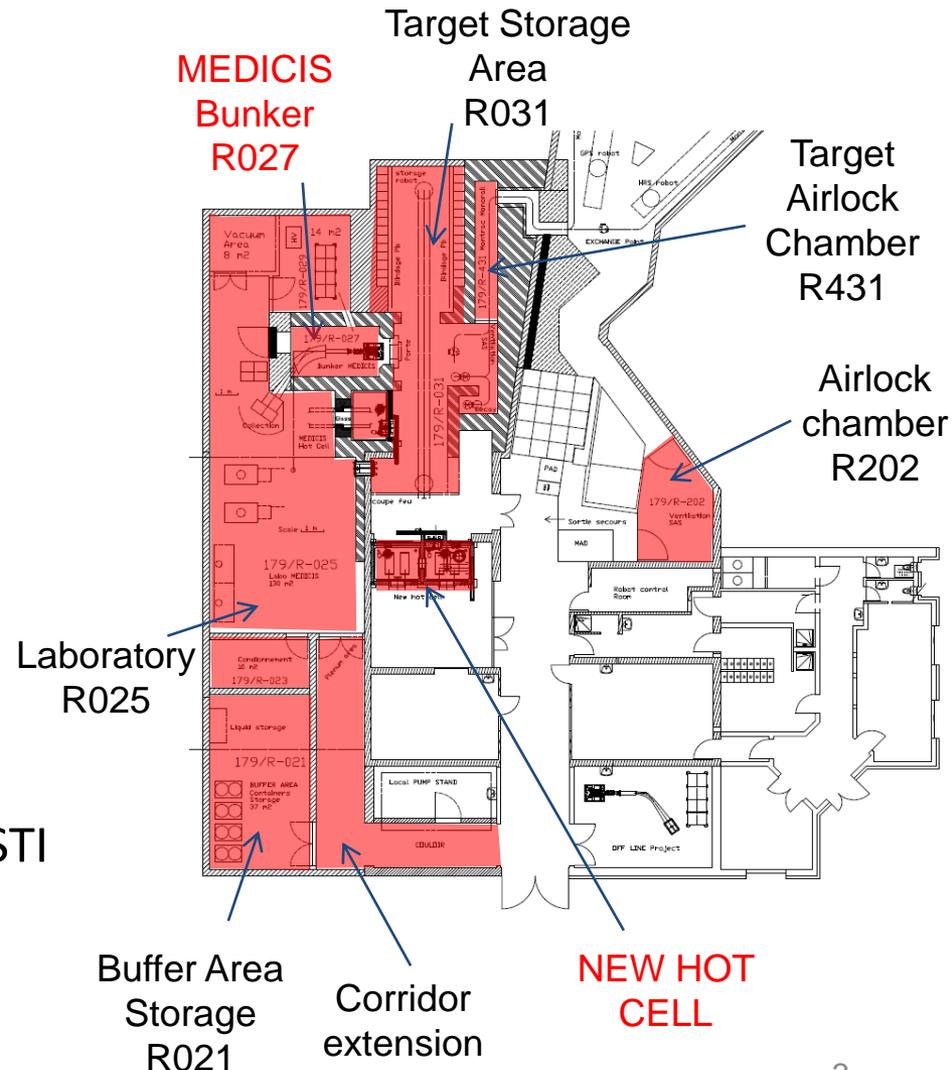
OUTLINE

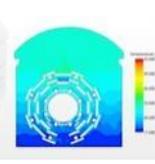
1. Plant description
 - Scope
 - Layout
 - Air management principles and PID
 - Required pressure hierarchy
 - Process and Instrument diagram
 - Fire compartments
2. Present status of CV works
3. Working group on improvement of system
4. Planning



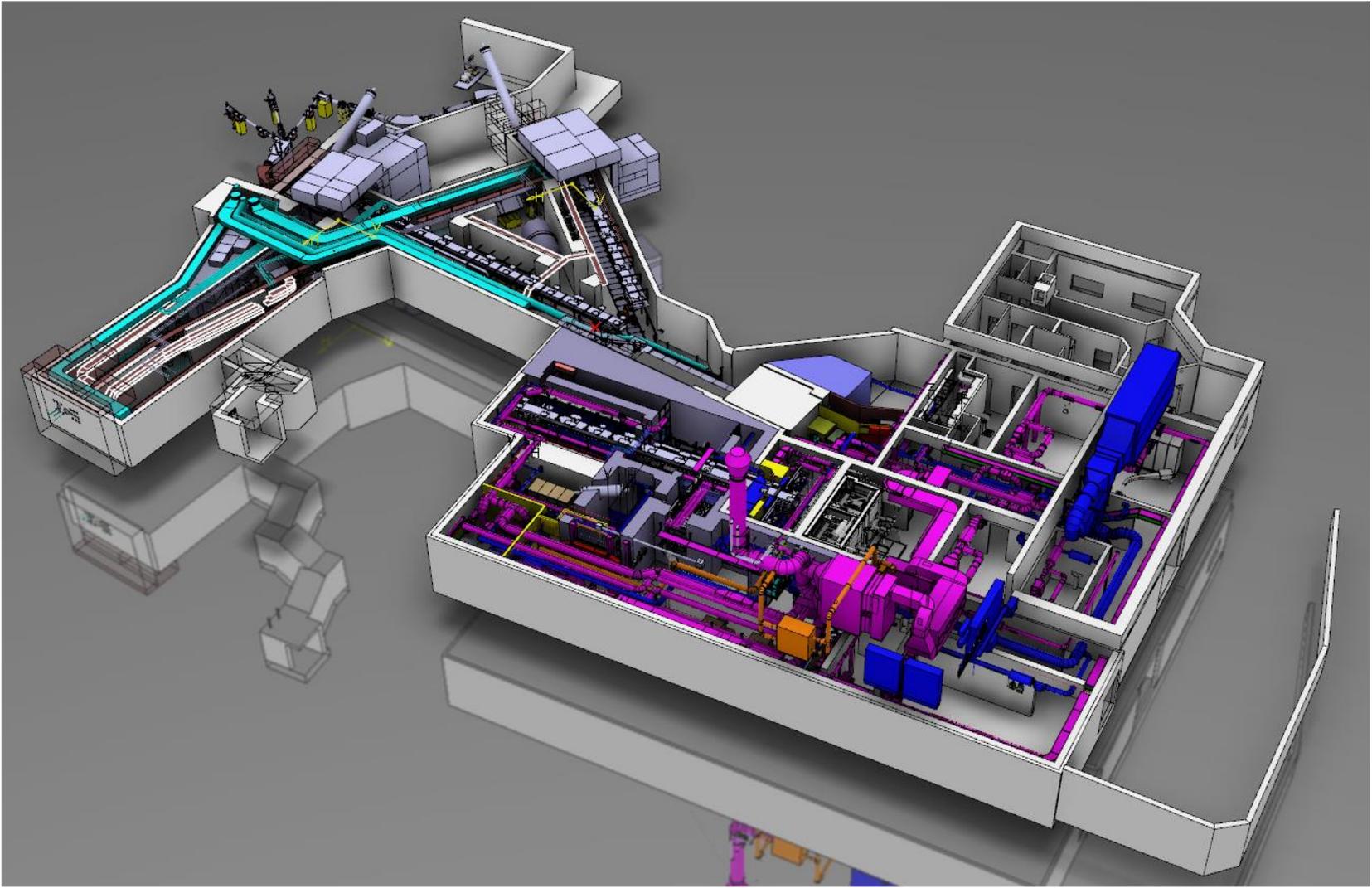
General description of the project

- The extension of the Class A laboratory started in LS1
- Ventilation plant: CV
 - Integration of previous system into the new layout
 - Construction of new areas
 - New global control system
- Hot cell supply with ancillary systems: STI





VENTILATION LAYOUT





AIR MANAGEMENT PRINCIPLES

Supply

- Full fresh air;
- Redundant air supply;
- Minimum of 5 air changes per room.

Extraction

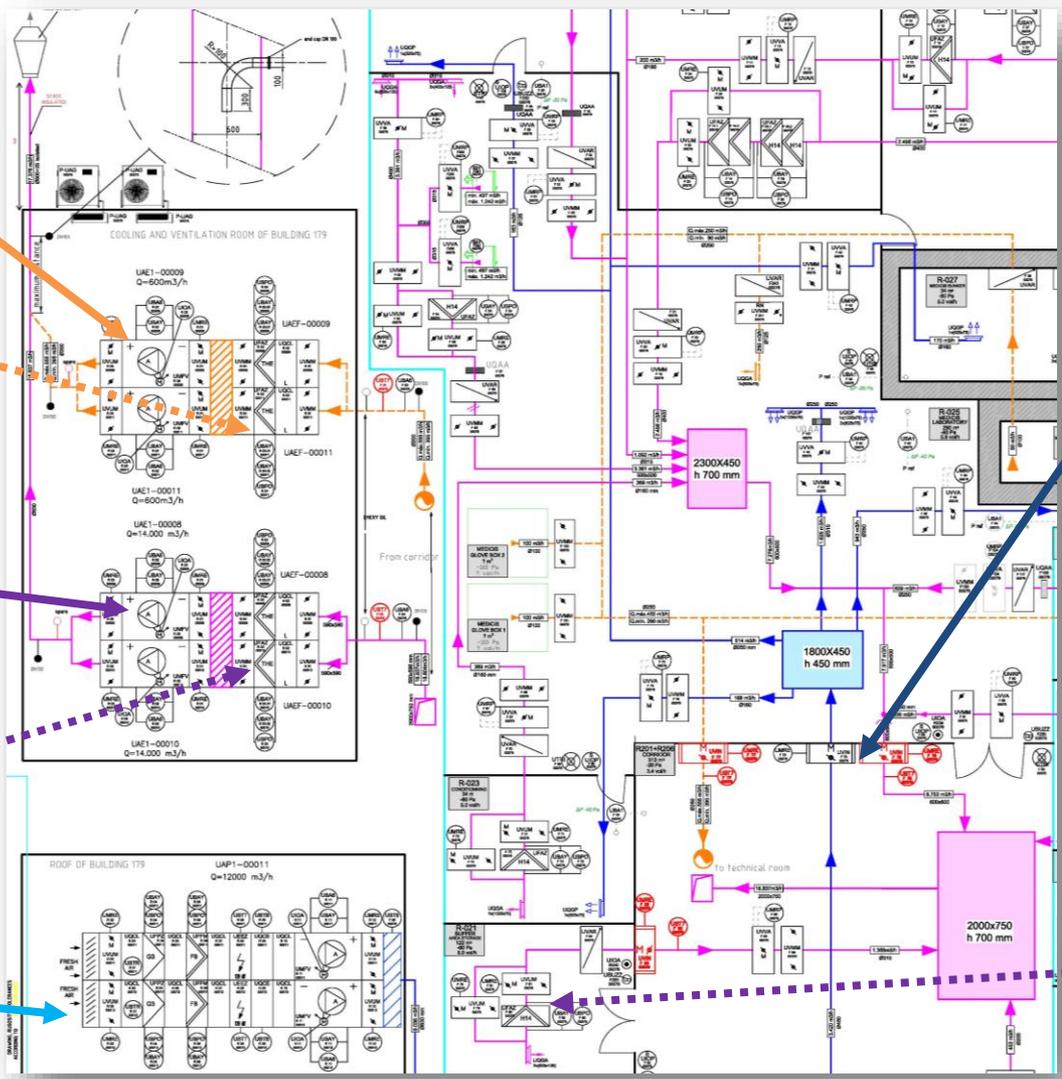
- Two separate and independent extraction systems for the:
 - Laboratory premises;
 - Process enclosures (hot cells and glove boxes);
- Redundant air extraction units;
- One single stack equipped with environmental air monitoring;
- Double filtration level.

Dynamic confinement

- Dynamic pressure cascade control;
- Confinement mode kept as long as possible in case of fire.

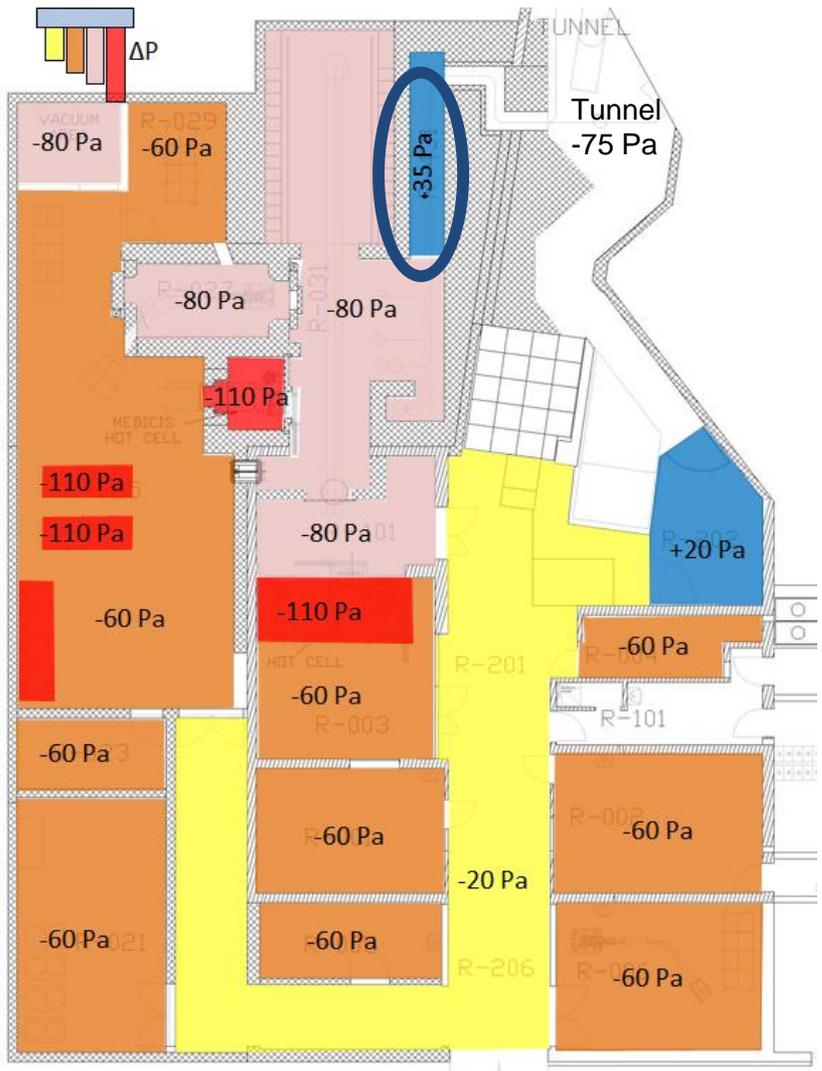


PROCESS & INSTRUMENT DIAGRAM





REQUIRED PRESSURE HIERARCHY



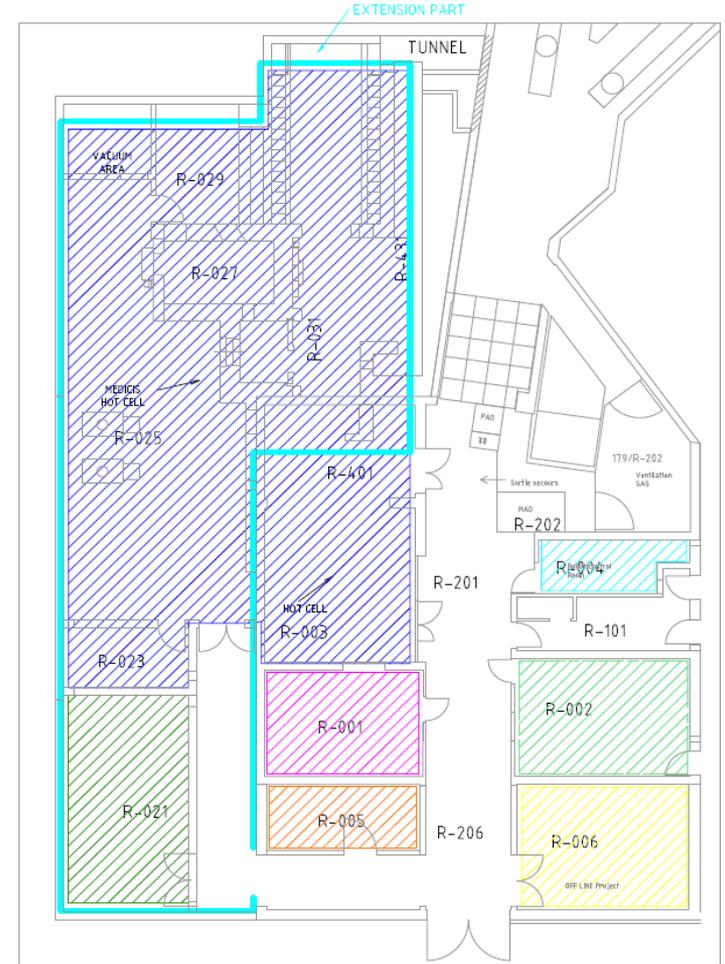
ZONE	Activity	Δp vs. Reference	Reference	Δp vs. Outdoors
Yellow	transport of radioactive material, no handling	-20 Pa	Outdoors	-20 Pa
Orange	handling of radioactive material with collective protections	-40 Pa	Corridor	-60 Pa
Purple	storage of contaminated material, presence of contamination expected	-60 Pa	Corridor	-80 Pa
Red	glove boxes or hot cells, confinement highly contaminated material	-50 Pa	Orange Zones	-110 Pa
Blue	Target Airlock Chamber R431	+110 Pa	Isolde Tunnel	+35 Pa
Blue	Airlock chamber R202	+40 Pa	Corridor	+20 Pa

New requirement



FIRE COMPARTMENTS

- MEDICIS laboratory contains 7 fire sectors.
- Fire matrix or Causes and Effects drawing (EDMS 1447622) describes the functioning of the ventilation in normal or during a fire scenario.



		Fonctionnement normal de la ventilation de bâtiment 179																	
		R-029	R-021	R-023	R-025	R-027	R-003	R-401	R-003	R-001	R-005	R-002	R-101	R-004	R-201	R-206	R-006	ALL COAM Evacuation	ALL COAM Fire
ACTION:	Normal	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Fire	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
SYSTEM	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...



Present status of CV works

- **June 2015:** Construction completed and laboratory class A commissioned. First Acceptance meeting.
- **September 2015:** As built documentation provided by contractor;
 - Duct leakage report missing;
 - Rusted air ducts, gaskets not compliant;
 - Pending non compliances (listed during Acceptance meeting).

Contractor accepts to solve non conformities.



- **November 2015:** Formal notice from CERN for the resolution of remaining non compliances.

Contractor confirms that all non conformities will be solved by end of 2015.
- **December 2015:** Resolution of non compliances by the contractor excluding corrective actions on ducts. New I/O test campaign by CERN for the second time.
- **February 2016:** Contractor provides as-built electrical drawing. CERN performs an independent duct leakage test: ducts not compliant (class A).



CERN approach to EMTE problem

Purchase + Legal Office + CV approach (1/3/2016):

- CERN does not trust the execution of the ductworks, the extraction one is critical for RP reasons;
- CERN bridges the part of the contract corresponding to the ductwork because of gross negligence (systematic non conformities);
- Purchase agreed to give the contract to second bidder (Spanish);
- CV checked availability this morning, confirmation at 12h00; 50-70 kCHF (deduced from the 250 kCHF outstanding payment to EMTE).

Responsibility:

- New supplier will be responsible of the airtightness of the ducts;
- EMTE remains responsible of the overall performance of the system.



WORKING GROUP ON IMPROVEMENT

Members:

- EN/STI: AP. Bernardes, R. Catherall
- EN/CV: A. Broche, R. Sanches Pedro

Context:

- Fire test during the commissioning:
 - the under-pressure of most rooms increased significantly;
 - the room pressure turned positive at restart;
- The dynamic mode during a fire scenario presently inhibited.

Mandate: EDMS 1520769

- To review the ventilation system response in case of fire in all configurations;
- To commission the hot-cell and the process ventilation;
- Propose additional improvements, where applicable (CEA collaboration).

Recommendations: EDMS 1564284

- 26 actions from Low to High priority to be done by GS/CV/EL/STI.
- 21 High priority interventions are confirmed by Group Leaders. Estimated cost is 247 kCHF.

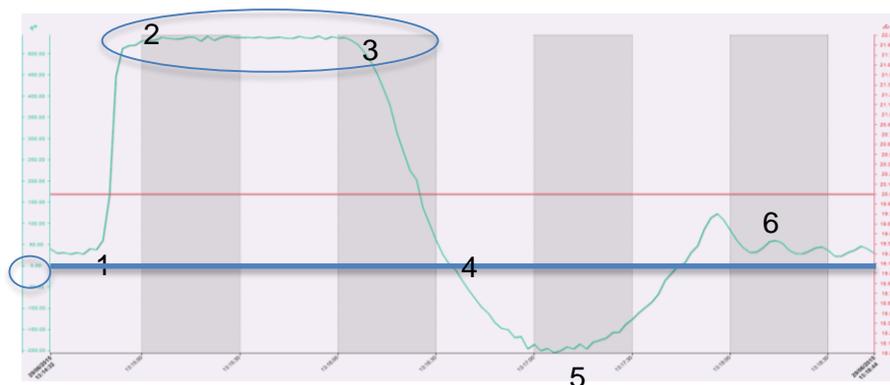


PROPOSED IMPROVEMENT ACTION

Remark: A5

- Under-pressure of -650 Pa during 7 seconds → OK.
→ OK. CEA confirms the absence of risks below - 1000 Pa.

- 1- Fire simulated
- 2- Max depressure
- 3- Fire inhibited
- 5- Max overpressure
- 6- Transitory period



Recommendations	Budget
Installation of manual opening systems of door	18.000 CHF
Time delay of 5 minutes before closing supply damper	
Removal of room emergency buttons	
Formal training twice per year	





PROPOSED IMPROVEMENT ACTION

Remark: A16

- The diesel power supply is not sufficient to supply all safety devices.

Recommendations	Budget
Completely new connection to the Meyrin diesel	100.000 CHF



Remark: A20

- The inherited first level of filtration in the back room of the hotcell is not bag-in bag-out.

Recommendations	Budget
Replacement with new filter casing in 179/R-401	6.000 CHF





PROPOSED IMPROVEMENT ACTION

Remark: A23

- The air intake of the hotcell is in the operator's room.

Recommendations	Budget
Relocation of air intake to the Hot Cell's back room. Space issue.	5.000 CHF



Remark: A25

- The modular and cleanable galvanised steel process pipework is too easily dismantlable (CEA consulting)

Recommendations	Budget
Replacement with stainless steel pipework.	35.000 CHF





PLANNING

1. Extraction duct replacement:

- Definition of the new supplier + partial bridge of the contract: March 2016;
- Duct replacement: before December 2016;
- Limited repairs on the supply ductwork will be done in EYETS (Labo Class A related).

2. Working Group's actions:

- Planned defined with STI-CV-EL
- All intervention planned in four slots for each quarter of 2016;
- All actions shall be closed for December 2016.

Conditioned to budget availability...



THANK YOU FOR YOUR ATTENTION

QUESTIONS ?