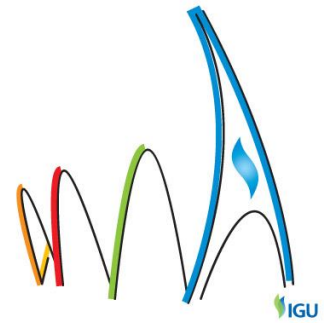


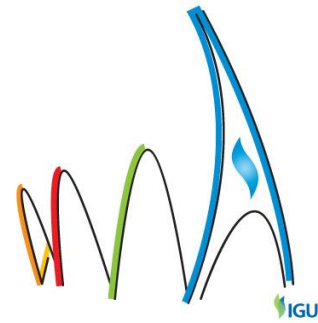
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*"GROWING TOGETHER TOWARDS A FRIENDLY PLANET"*



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## **Smart Gas Infrastructures Program in France**

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### Background

In France, remote monitoring is required by a national decree which specifies that pressure reduction stations (PRS) operating between four and twenty-five bars must be equipped with devices able to measure and record gas pressure. Today, the remote monitoring structure of GrDF is composed of :

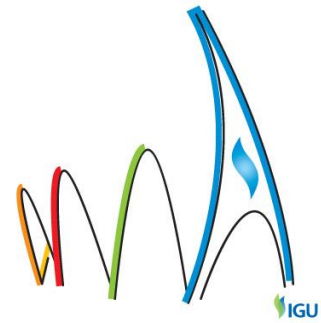
- About two thousand remotely monitored PRS
- Eighteen supervising local information systems (IS)
- And thirty phones

Each PRS is able to generate an alert and send it to a supervising IS which forwards it to the relevant phone.



### Aim

As energy and environment targets are shaping the future of energy distribution networks, GrDF is facing new challenges namely tools and processes reliability, IS design and security improvement, facility obsolescence and overpressure incidents management. In order to



manage these issues and improve its efficiency, GrDF has launched a modernization program in cooperation with agents in the field. The expected benefits of this program are security improvement and preparation of the future in an increasingly complex environment.

#### Methods

The GrDF Smart Infrastructures Program consists in deploying monitoring devices at different control points of the gas distribution network.

#### Modernization of the PRS:

- Installation in the existing 2000 PRS of “smart sensor’s which are wireless and self sufficient on energy”;
- Installation of 2000 additional PRS’s equipped with “smart sensor”;
- Integration of the SCADA into the computerized maintenance management system of GrDF. The SCADA will include role based accesses, which means that local team will only have to access their own scope.

In concrete terms, PRS will be equipped with :

- An upstream pressure sensor
- A downstream pressure sensor
- An open/close security valve detector
- A door opening detection
- And if necessary, a flood sensor

Every morning, hourly pressure measurement statistics, digital state changes and defaults measured the previous day will be sent to the SCADA. At anytime, the SCADA will be able to summon the equipment. All security valve closing, rising or falling pressure alarms, flood detections and door opening are transmitted in real time by the equipment to the phone of the operator concerned.

As for the communication chain, the project will integrate various items such as telecommunication systems, hosting and data acquisition systems which take into account a part of the current communication chain.

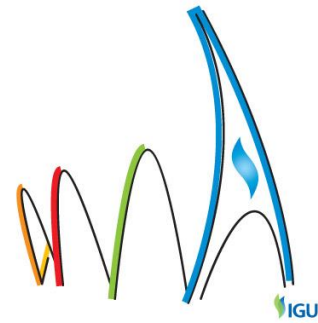
The project milestones are :

- Equipment certification in 2014
- SCADA commissioning in 2015
- Creation of three pilot sites in 2015
- And finally, equipment roll out for selected PRS’s from 2016 to 2020

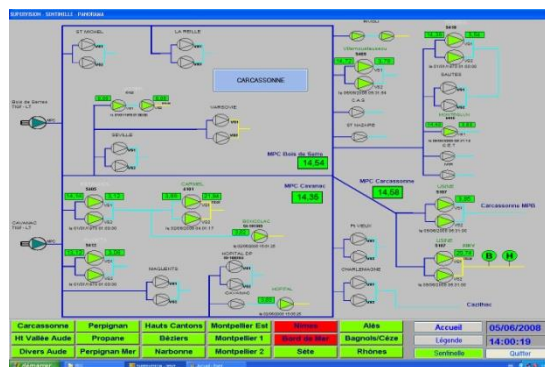
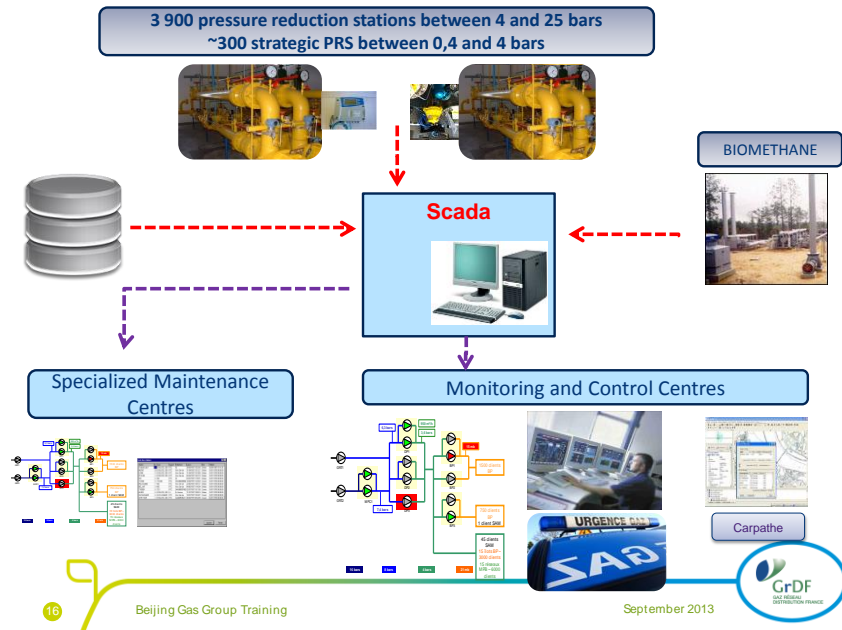
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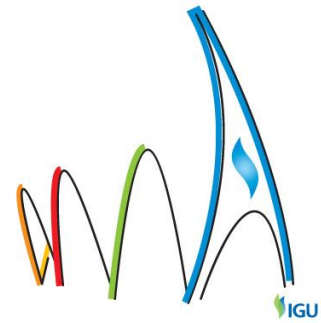


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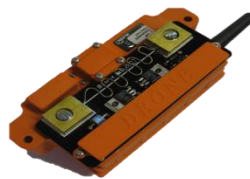


### Modernization of the Cathodic Protection System

The goal of the cathodic protection remote monitoring is an optimization of maintenance by reducing the number of operators control visits. Benefits will be security for the network and employees, productivity and automatic documenting of measures.



Remote monitoring only concerns two kinds of cathodic protection: impressed current protection and drainage units. Other solutions for cathodic protection do exist, but they are not remotely monitored. For impressed current stations, potential and intensity will be measured once a day; every second for the drainage units. In case of a threshold excess, an alert will be generated the next day.



## Results

The Smart Infrastructures Program is a key not only to conforming with current regulation requirements in France but also to preparing the future role of the gas distribution network. New monitoring techniques will enable a better understanding of the gas flows and quality, paving the way for an improved efficiency of the infrastructure management processes. Information received by the operators will be more precise, more reliable, allowing optimization of grid operations and supporting integration of new types gas such as biomethane and perhaps hydrogen tomorrow.

In 2014, on top of the modernization of the gas grid, GrDF has committed to an R&D project exploring grid operation optimization called Gontrand. The expected results are :

- An integrated platform prototype for dynamic network control and monitoring
- The putting in place of a real-time gas analysis system prototype.
- A Strengthening in telecommunication robustness to compatible equipment

## Conclusions

Largest natural gas distribution system operator in Europe, GrDF connects 11 million consumers to the gas grid and operates at the heart of energy strategies of the French territories. GrDF modernization strategy, including advanced infrastructure monitoring and Gazpar smart meter roll-out, is paving the way towards a smarter gas network and ensures the contribution of the gas grid to energy efficiency and the development of renewable energy sources. As an illustration, the number of biomethane injection stations in France is quickly increasing. If six stations are currently operational, fifty should be connected to the grid every year starting in 2016.