# Water Production in Nice

## The Super-Rimiez site and its history


The **Super-Rimiez** drinking water plant, opened in 1972, is today part of **Nice**'s heritage. This site is a prestigious reference and is considered to be one of the most modern sites for the production of drinking water in **Europe**. During the last two years an extension to the plant was recently undertaken increasing its production capacity from 1,000 litres per second to 1,800 i.e. 150,000m3 per day.

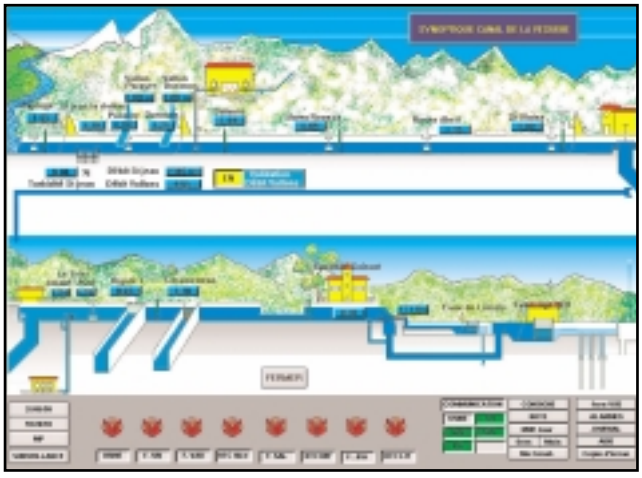
The plant benefits from natural resources cascading from the southern Alps. The high water quality rarely varies as there is no pollution since there are no agricultural or industrial activities in the vicinity. The quality of the water only varies if there are storms, which leads to an increase in suspended matter, up to 13 g per litre (normally close to 0). All these elements are natural and well documented, since the same ones often reappear. **Super-Rimiez** uses the ozonization technique to sterilize the water.

The **Compagnie Générale des Eaux** has nearly always been present at this site, i.e. since the Principality of **Nice** became part of **France** in 1884. *"The promise made at that time by **Napoleon III** to the people of **Nice** was: provide them with water and the railway"* recounts **François Debelle**, Assistant Manager of the **Compagnie Generale des Eaux** agency. At the end of the 19th century, major work was carried out such as the construction of the **Vésubie** canal which draws in water at **Saint Jean La Rivière**, 270 meters above sea level.

## Project Context

The solution developed in **Nice** is a convincing illustration of the partnership strategy of a software developer, **ARC Informatique**, in conjunction with Schneider, a major supplier of automatic systems.

The monitoring system ensures not only centralized on-site management of the various stages of the water treatment process at the **Super-Rimiez** plant, but also the remote management of upstream and downstream networks including all the relevant hydraulic systems (pumping stations, reservoirs, etc.). This involves, upstream from the Canal, the secondary treatment plants (the Var and "Jean Favre" plants, etc.) and the warning stations, etc.



Downstream, this incorporates the entire distribution network for the city of **Nice**, including extensions stretching as far as Italy (if required, the **Compagnie Generale des Eaux** can supply the **Principality of Monaco**).

It includes 100 programmable logic systems, 80 pumping stations, and about 100 reservoirs. In 1974, there were only 20 stations with programmable logic systems. In 1981, the **Compagnie Generale des Eaux** decided, in conjunction with **Schneider**, to install intelligent programmable logic systems.

Since then, computerized models have been created for the reservoirs. In 1992, the first object approach was made with **PcVue**. Today the site operates entirely using **PcVue 32** running under **Windows NT**.

## Main production stages

**1 - Macrostraining**: The water carried by the Vésubie canal, crosses a self cleaning screen and then a screen mounted on a rotating drum, which captures all impurities which are larger than the grid mesh.

**2 - Coagulation**: The addition of a coagulant to the water coats the suspended matter, making it heavier allowing easier precipitation.

**3 - Flocculation**: The treated water passes into flocculating tanks where large stirrers agitate the water to bind flocculent particles together to make them heavier.

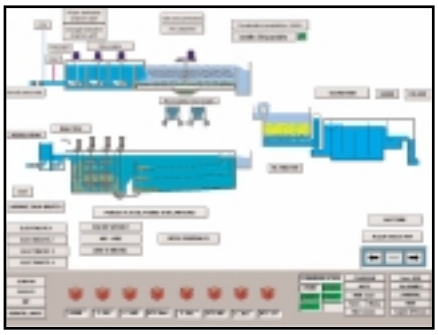
With the Actifio process, the flocculent particles are ballasted with micro-sand.

**4 - Decantation**: The gravity action eliminates most of the flocculent particles formed during the previous phases.

Decantation takes two hours using classic techniques.
It is reduced to 20 minutes with the Actifio process developed by OTV.

This "ballasted flocculent lamellar clarifier" system was implemented on the site in 1998.

**5 - Filtration**: The water passes through a sand bed (1 meter thick) which captures the last suspended particles and flocculent particles which remain after decantation.

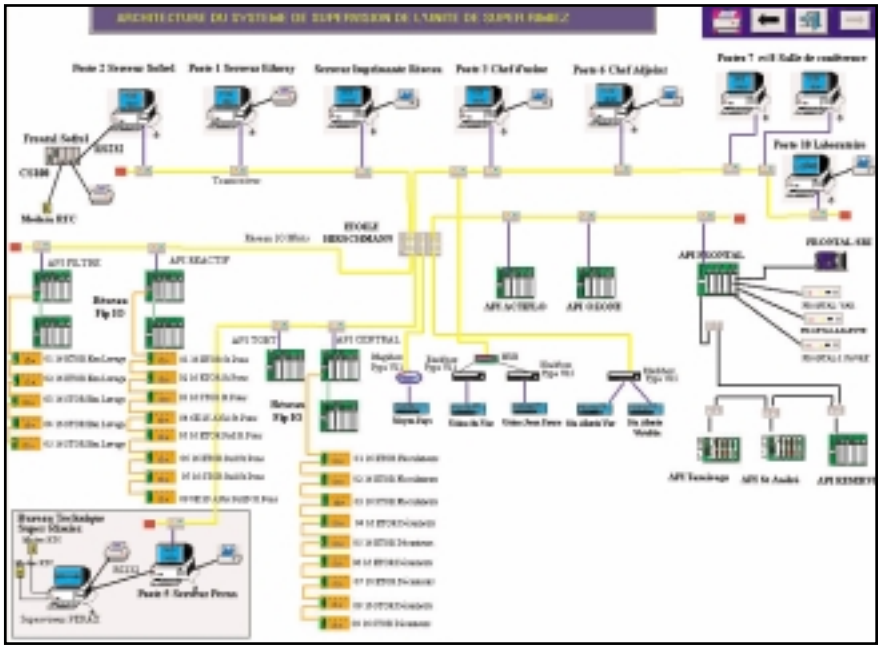


Twelve sand filters are installed on the site.

**6 - Ozonization**: the filtered water is sterilized by ozonization, which effectively destroys viruses and bacteria.

It neutralizes the taste, odor and color. The taste of water treated by ozonization is better than that treated by chlorination.

## Architecture



The site uses 14 **PcVue 32** monitoring stations. Ten stations and seven programmable logic systems (April 5000 type) have been installed directly on a 10-Mbit **Ethernet** network. This network has a radial structure: five branches are grouped using a "Hirschmann Star". This architecture is chosen to meet safety requirements: the breakdown of one of the branches (or sub-network) will not affect the others.

Among the **PcVue 32** supervisors installed on the network, some stations have a dedicated configuration:

**Station 1** communicates with the April 5000 stations using the Ethway protocol.

**Station 6**, linked to the Ethway protocol, provides back-up assistance for station 1.

**Station 5** communicates using the PERAX protocol with an ARLEQUIN concentrator.

**Station 2** communicates using the SOFBUS protocol with a CS100 SOFREL front end.

All the other PCs are clients of the three communication servers. The **Ethernet** network is extended to three remote sites by medium bit rate TRANSFIX links.

An April 5000 type PLC is used as a concentrator and exchanges information in JBUS mode with four PB 400 type front ends. The four front ends feed back in real time the information coming from the various pumping stations or treatment plants in the **Nice** region through specialized lines leased from France Telecom.
The monitoring stations collect information coming from the stations located in a sector stretching from Isola 2000 to Ventimiglia in **Italy**.

The site currently uses a total of:

80 Schneider PLC's which exchange information with the front ends.

30 PERAX telemetry outstations on the STN network.

42 SOFREL telemetry outstations on the STN network.

The application manages about 11,000 variables in real time and 2,500 variables on the PSTN network.

## Assessment: genuine advantages

**PcVue 32** enables all water management processes to be monitored from the **Nice** operational center. This application operates using simple telephone or rented lines which means that monitoring can now cover large areas.

The choice of telemetry outstations has enabled several units to constantly view and monitor a number of processes and to intervene rapidly in the event of a network fault.

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