APPLICATION NOTE:

TESTING LEAKAGE OF COOLING WATER OF (NUCLEAR) POWER PLANT BY USING A FLUORESCENCE TRACER

IIn Japan there are many (nuclear) power plants and they are all build on a rocky based bottom. These rocks also have underground water streams, in case of an earthquake (not unrealistic in JAPAN) radioactive cooling water might leak through the rocks into these clear water streams and spread the radio- active radiation on to a greater area, which will be extremely dangerous for environment and all living creatures.
The idea is to drill several deep holes in a specific area around the power plant (aprox. 50 m deep) and measure fluorescence in the underground water stream.
To the cooling water used in the coolwater system of the power plant a tracer is added, this tracer will cause a strong fluorescence signal when measured with the AVANTES system in a 50 meters deep well. When in case of an earthquake cooling water would leak it can be traced within a reasonable time as the distance from detection well to power plant is short.

For the company Taisei Kiso Sekkei we developed a special flow cell with an integrated LED 480 nm, an AvaSpec with a backthinned detector
(VB grating and SLIT 200) will detect the fluorescence in the control room.
A 50 m powercable and a 50 m fiber was part of the solution as well.