



Home of the **A**coustic **S**cintillation **F**low **M**eter

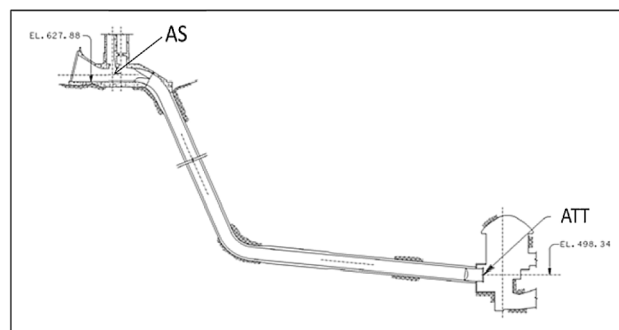
Flow Comparison Test at GM Shrum (GMS) Powerplant

A large scale flow comparison between acoustic time of travel (ATT) and acoustic scintillation (AS) flowmeters was conducted at the BC Hydro's GMS powerplant. Both of these flowmeters are in use in the hydropower world but, because of its portability, the AS flowmeter is more economical when testing more than one unit at a plant.

GM Shrum underground powerhouse has 10 Francis units providing a total of 2730 MW under a head of 161 m. BC Hydro has recently upgraded five units, but an efficiency test using the ATT flowmeter was undertaken on only one of the units, as the other units did not have the ATT flowmeter installed. However, BC Hydro is considering whether to test the remaining 4 uprated units so that measured efficiencies could be used to optimize the dispatch from the plant. If the ATT flowmeter were to be used for these tests, extensive transducers installations would have had to be undertaken in all penstocks. Instead, for economic reasons, BC Hydro opted to consider testing the 4 units using the AS flowmeter.



WAC Bennett Dam and GMS Powerplant



Location of the two flow measuring methods (Unit 4)

By carrying out the flow comparison measurements with the ATT and AS flowmeters at the unit for which the efficiency test was performed, the comparison test verified that the measurement uncertainty of the AS flowmeter is comparable to the uncertainty of the ATT flowmeter at $\pm 1.0\%$. Furthermore, the test indicated that the uncertainty of the measurement could be as low as $\pm 0.2\%$ if the upstream hydraulic conditions are the same for every intake. This can be easily achieved by utilizing the portable nature of the AS flowmeter and will be sufficiently accurate for the dispatch optimization.

The comparison test therefore confirmed that the AS flowmeter is cost effective for multi-unit testing at a powerplant.