

# Governor Products

## Independent Overspeed Kits

### Standard Retrofit Kits for all Turbine/Generators

#### OPTION 1: BASIC OVERSPEED PROTECTION

#### OPTION 2: PLC-BASED OVERSPEED SWITCH SYSTEM WITH CREEP DETECTION

#### OPTION 3: MECHANICAL OVERSPEED SWITCH KIT

Most hydro turbine/generators, even those dating back to the early 20th century, were equipped with a mechanical overspeed switch. This switch was mechanically connected to the turbine/generator shaft and performed the function of a back-up, safety shutdown mechanism, independent from the normal governor control mechanism. When this switch tripped, the Governor Start relay was dropped, which forced the governor into an emergency shutdown state. Other unit protective systems were also slaved to this mechanical switch.

Early on, the mechanical overspeed switch was incorporated in the Permanent Magnet Generator (PMG). Later, with the advent of the analog governor, the mechanical overspeed switch was incorporated into the Speed Signal Generator (SSG) assembly. During most digital governor retrofits, the fail-safe mechanical overspeed switch is retained and continues to provide its safety shutdown function. Some plants either never had a mechanical overspeed switch or their owners prefer to get rid of the PMG or SSG during conversion to digital governing. For these plants we offer three different solutions:

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#### OPTION 1: BASIC OVERSPEED SWITCH WITH ANALOG SPEED SIGNAL

For small generating units, or utilities on a tight budget, our Basic Kit provides the security of an independent speed sensing device, and adjustable speed switch output, as well

as an analog speed signal output that can be used for monitoring by remote SCADA systems.

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#### OPTION 2: PLC-BASED OVERSPEED SWITCH SYSTEM WITH CREEP DETECTION

Our PLC-Based kit utilizes an industry-standard PLC system and redundant speed pickups to provide a higher level of functionality and availability. Two speed pickups and a standard mounting bracket are included, along with a small color touchscreen that dramatically simplifies field adjustment of speed switch settings, especially compared to cam-operated speed switches. The speed pick-ups can be mounted either within a modified PMG/SSG assembly or

aimed at a new 'wrap-around' shaft encoder (provided by others or available from American Governor) with at least 120 precisely-spaced ferrous 'teeth' to serve as the target for the speed pick-ups. The pre-programmed PLC includes eight (8) independently-adjustable speed switch outputs and two System Health contact outputs that can be integrated into your plant protection and annunciation systems.

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#### OPTION 3: MECHANICAL OVERSPEED SWITCH ASSEMBLY WITH TOOTHED WHEEL

For those customers who prefer the security of a strictly-mechanical overspeed switch, we offer an SSG Replacement Kit that includes one off-the-shelf mechanical overspeed switch (Allen-Bradley Model 808-M1) that can be directly-coupled to the generator stub shaft (custom mounting by Others may

be required). The kit also includes a shaft-mounted toothed wheel that is suitable for use by the speed pick-ups described in Option 2 above. All of the equipment is provided in a small NEMA-12 cabinet, ready for generator mounting.

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For the utmost in flexibility and protection Option 2 and Option 3 are recommended and have been designed to work together as a system. Or, you can combine Option 1 and Option 3 for the safety of a mechanical overspeed switch along with a second, easily-adjusted speed switch and an analog speed signal output for your SCADA system.

retrofit kits American Governor currently offers, please contact your Regional Sales Engineer. They're in your time zone and ready to serve you!

From legacy parts for your vintage governor to expert field service and on-call technical support, plus the best on-site and factory training classes available anywhere, American Governor is your "one-stop shop" for complete hydroelectric governor support.

For more information about our Independent Overspeed Kits - or any of the dozen or so other governor and oil pump



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