Acceleration Device and Relay

As an additional protection against overspeed, an acceleration device and relay are installed on this machine. On the rejection of full load, the acceleration device and relay will cause the control valves to close sooner than they would as operated by the normal governing system.

The acceleration device and relay consists of a dashpot, a pilot valve mechanism and a piston element which acts to control the motion of the input linkage to the V-2 pilot valve of the control valve relay upon load rejection. The dashpot is connected to an intermediate point and the pilot valve is connected to the end point of the operating lever of the acceleration device and relay. The other end of the operating lever is connected to the speed relay output linkage. The dashpot is capable of following slow, normal movements of the speed relay. Here, the pilot valve acts as the fulcrum of the operating lever.

If an abnormally fast turbine acceleration occurs (as would happen on rejection of full load), the operating lever moves faster than the dashpot piston is capable of. Now the pilot valve moves up and the dashpot becomes the fulcrum. Upon upward movement of the acceleration pilot valve, oil is dumped from beneath the piston element, causing it to move down and override the normal control inputs to the V-2 pilot valve. The V-2 pilot valve is also moved down, which causes oil in the control valve relay to dump, quickly closing the control valve. As the control valve relay moves closed, the V-3 pilot valve will move up, since the input from the pressure regulator unit will stay approximately fixed during the short time interval which has elapsed. The motion of the V-3 pilot valve will open the bypass relay and the bypass valves in turn. This is required to hold the reactor pressure within acceptable limits during the full load rejection.