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## **Question 90: Do you have experience with slide/plug valve independent movements without any controller action?**

**Matthew Meyers** (Western Refining)

There are 5 categories of initial causes which may lead to erratic slide valve movements in auto mode. These are oil contamination, servo valve amplifier tuning, part failure, mechanical linkages, and electrical connections. Oil contamination is the initial cause a vast majority of the time.

Oil must be kept very clean at all times. From pre-commissioning to start-up, the fluid must be maintained at a spec equal to or better than ISO 14/11. This spec allows that only 80-160 particles per mL are between 6 and 14 microns in diameter and that only 10 – 20 particles per mL are greater than 14 microns in diameter. If this spec is not maintained, contamination may occur including particulate silt or chips arising from two or three body interactions and stress raisers caused by particle collisions. In addition, free or dissolved water and air may create more particles through corrosion. The wear resulting on the servo valve itself may cause the valve to stick and chatter. The clearance of the servo valve is only 1 to 5 microns.

The servo valve amplifier may require re-tuning. The gain may be too high or low, the servo dither may be set too high, the servo balance may be offset, or the amplifier may need recalibration altogether.

The transducer at the end of the hydraulic cylinder may fail, causing the amplifier to lose feedback position of the slide valve. If this occurs, the DCS will also likely lose indication since the amplifier also relays the position indication to the DCS.

Any loose mechanical linkages or electrical connections may also cause unstable auto control. In this case, tighten all electrical connections and make sure there are no loose mechanical linkages.

**Dwight Agnello-Dean** (BP)

Our more common issues are lack of slide valve movement with controller action. We have had slide valves have move seemingly independent of controller action. Leaks in the hydraulic lines and failure of the servomechanism have been identified as primary causes.

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