MANAGING OILFIELD OPERATIONS UNDER ADVERSE ECONOMICS

BOTTOM LINE
During adverse economic conditions, operators must explore all possibilities for reducing operating costs or increasing production. If wells or leases must be shut in, precautions must be taken so that production can be cost-effectively regained when wells are brought back on line.

PROBLEM ADDRESSED
Decisions to shut in wells must be made quickly, but wisely. For some wells, damage removal or stimulation treatments are an option. Operators must know how to identify those wells, and then how to remove damage or stimulate the wells. Operators also must know which reservoirs and wells are rate-sensitive. To minimize costs when bringing production back on, it is also important to know how to protect both downhole and surface equipment.

TECHNOLOGY OVERVIEW
Operators must consider many factors when faced with sub-economic conditions. They must decide whether to shut-in individual wells, or the entire lease, which may impact keeping the lease. Temporary shut down will bring concerns about rate recovery. Operators usually know which reservoirs are rate-sensitive (i.e., the well will not produce as strongly when brought back on line); most are not. In many cases, wells may produce at a higher rate after shut in, partially alleviating the revenue loss.

Concerns about surface facilities are related to corrosion and solids buildup within process equipment, the deterioration of electrical equipment and instrumentation, and pilfering. When shutting in, the most important decisions deal with flushing the system, excluding oxygen, and wrapping critical equipment. Before reactivating, producers should visually inspect all electrical systems and equipment. It also is important to pay attention to purging and start-up procedures. When shutting in facilities, producers will probably not know the duration, so they must balance the cost and time commitments against potential damage.

Wellbore Damage. Potential sources of wellbore damage include phase separation, water blockage, completion fluid effects, wettability changes, and corrosion/scale. To avoid downhole corrosion damage, wells should be chemically treated with an appropriate inhibitor prior to shut in.

Productivity of many wells is restricted by wellbore damage, either near wellbore or in-depth. Removal treatments are an option for increasing a well’s margin. To assess wellbore conditions, one must review the well’s production and operations history, fluids and solids data, and the experiences of other wells in the area. In many cases, well testing will be required to assess the damage and its causes. For damage removal, changes are more economically significant at lower skin values (i.e., reducing skin from 5 to 0 usually yields more return than reducing skin from 25 to 20).