An oil producer in North Africa identified paraffin deposition in the tubing of several wells as production declined and the flowing well head temperatures dropped below the wax appearance temperature of the oil. The increased deposition restricted oil flow, which resulted in an acceleration in production decline.

SOLUTION
ChampionX suggested a clean-out program comprised of two distinct and separate phases.

The first phase was designed to remove existing organic deposits from the production string, ensuring the solvent pill and base oil spacers sent in to clean out the near well-bore area did not displace solids from the tubing into the formation. The second phase was the stimulation stage, which was threefold and covered the probable damage mechanisms.

A well test was performed prior to the combination clean out to determine the overall effectiveness of the program. By monitoring injection pressure during the execution of the program, it would be possible to ascertain if a specific stage of the stimulation has resulted in an improvement.

ACPC26004A provides safe paraffin deposit clean out

LENGTH OF SHUT-IN TREATMENT BEFORE WELL RETURNED TO PRODUCTION

12 hrs.
Clean-out operation:

- Bullhead one tubing displacement volume of ACPC26004A into the well. The tubing volume needed to be accurately calculated to prevent displacement into the perforations.
- Shut in the well for 6-12 hours to allow the solvent to penetrate the deposits.
- Produce the well back to the surface, taking samples at intervals to check for the presence of displaced paraffinic or asphaltenic solids.

RESULTS

ACPC26004A was safely applied to the well and the spent solvent was returned to the surface when production was brought back on after a 12-hour shut in period.

Caliper checks and visual checks of the spent solvent returning to the surface confirmed that paraffinic deposits had been removed from the top 300 m of the production tubing.

ACPC26004A was implemented safely and allowed the operator to pass a calliper gauge cleanly down the well without hindrance. After the intervention, the well returned to normal production.

CONCLUSION

This clean-out procedure has been successfully used by ChampionX to clean production tubing prior to executing hundreds of parasqueeze and asphaltene squeeze programs for more than two decades.