

Fig. 6—The NexLift SPM from Petroleum Technology Company enhances the robustness of the completion string.



### Side-Pocket Mandrel

The Petroleum Technology Company (PTC) introduced a single-piece, unwelded side-pocket mandrel (SPM) for the upstream oil and gas industry, removing a decades-old integrity risk. The NexLift SPM is machined from a single solid steel bar—replacing aged SPM technology that traditionally comprised four components and entirely removing the challenges created by welding and heat treatment (Fig. 6). The industry's long experience of collapsed and parted mandrels prompted PTC to develop a solution that would be more robust, reducing the potential for nonproductive time on assets caused by failed mandrels. PTC's in-house engineering and manufacturing design capabilities now allow for precision machining of internal geometries for single-piece mandrels that were previously impossible to create using conventional techniques. The NexLift SPM enhances the robustness of the completion string and is ideal for challenging well applications in which superior structural integrity and enhanced pressure capabilities are required. Eliminating the risk associated with a welded component brings the SPM to the same structural-integrity level as the other machined components in the string. It also brings the same standard of surface finish, vastly improving component alignment

and facilitating improved quality control in completions.

► For additional information, visit [www.ptc.as](http://www.ptc.as).

### Hydraulic-Fracturing Service

To maximize the stimulated fracture network while still using low-viscosity, water-based fracturing fluids, Baker Hughes developed its Ascent fracturing service. The service combines advanced modeling and specialized pumping techniques to effectively place strong, ultralightweight proppants above the depth of the lateral. The extremely strong, “buoyant” proppants replace a portion of the sand during the stimulation treatment to ensure that more of the fracture's high side remains open following fracture closure. Because they are nearly the same density as the fluid, the ultralightweight proppants will not fall to the bottom of the fracture, greatly expanding the conductive fracture area and significantly increasing the effectiveness of the stimulation. As an added benefit, overall proppant and water volumes, along with the related transportation and pumping costs, are reduced. To determine the best treatment design, offset-well data are used to evaluate the increase in conductive fracture area that can be expected by treating the new well with the optimized service. In a 19-well, 36-month study in the Barnett shale, Ascent enabled an operator to increase hydrocarbon recovery by 117% over the average of the conventionally treated wells of similar depth and length within a 2-mile radius. Proppant volumes were lowered, and water usage decreased by 20%.

► For additional information, visit [www.bakerhughes.com](http://www.bakerhughes.com).

### Guide Shoe

The HydroGRS guide/reamer shoe from Vertechs is designed to assist in getting the casing to bottom in difficult environments, saving time and overall costs. The shoe has a proven track record of getting casing to bottom in a significantly shorter time when swelling shales, ledges, and washed-out areas are hampering the ability to get casing to total depth successful-



Fig. 7—Vertechs' HydroGRS guide/reamer shoe reduces time and cost in getting the casing to bottom in difficult environments.

ly. The HydroGRS features an eccentric rotary guide/reamer nose to negotiate the casing string through troublesome hole conditions quickly (Fig. 7). The nose is free to rotate as needed to “follow” the hole while running casing but can be rotated with pump pressure to actually ream the hole if necessary. An aluminum nose assists in applications where drilling out is required, whereas a steel-alloy nose is for use in applications where drilling out is not required (carbide hardfacing can be added at customer request). The HydroGRS has a low torque output to minimize the possibility of sidetracking the wellbore while reaming. Internal components are all aluminum alloy and fully drillable when run with the aluminum nose, to allow drilling to continue below the casing shoe after cementing. An optional roller-guide section can reduce friction of the shoe track during casing running. While the HydroGRS features standard L-80 metallurgy, that can vary per customer request. **JPT**

► For additional information, visit [www.vertechs.com](http://www.vertechs.com).