

BETA SUBSEA SYSTEMS

DIV. BAUGH CONSULTING ENGINEERS, INC.

20 KSI BOP DESIGN PROJECT

A COMPLETE DESIGN OF AN 18.75" - 20 K.S.I. BOP STACK FROM A CLEAN SHEET OF PAPER.

OUR BACKGROUND: This work has been based on more than 60 years experience with more than 150 U.S. patents issued including on most parts of a subsea blowout preventer stack.

BOP STACK:

1. 20 K.S.I. stack as short as a conventional 15 K.S.I. stack.
2. 20 K.S.I. stack as light as a conventional 15 K.S.I. stack.
3. All electric actuators can be done
4. Substantially changed structure (Note: 150 gallons of depth compensated accumulators are shown in the drawing)
5. Reduce clutter - note the drawing to the right.

RAM BLOWOUT PREVENTER

1. Elimination of bonnet bolting
2. Shear rams with face seals w/o bending the pipe
3. Rams with controlled pressure amplification on face seals
4. Pressure balanced rams
5. Low volume requirements for shear rams

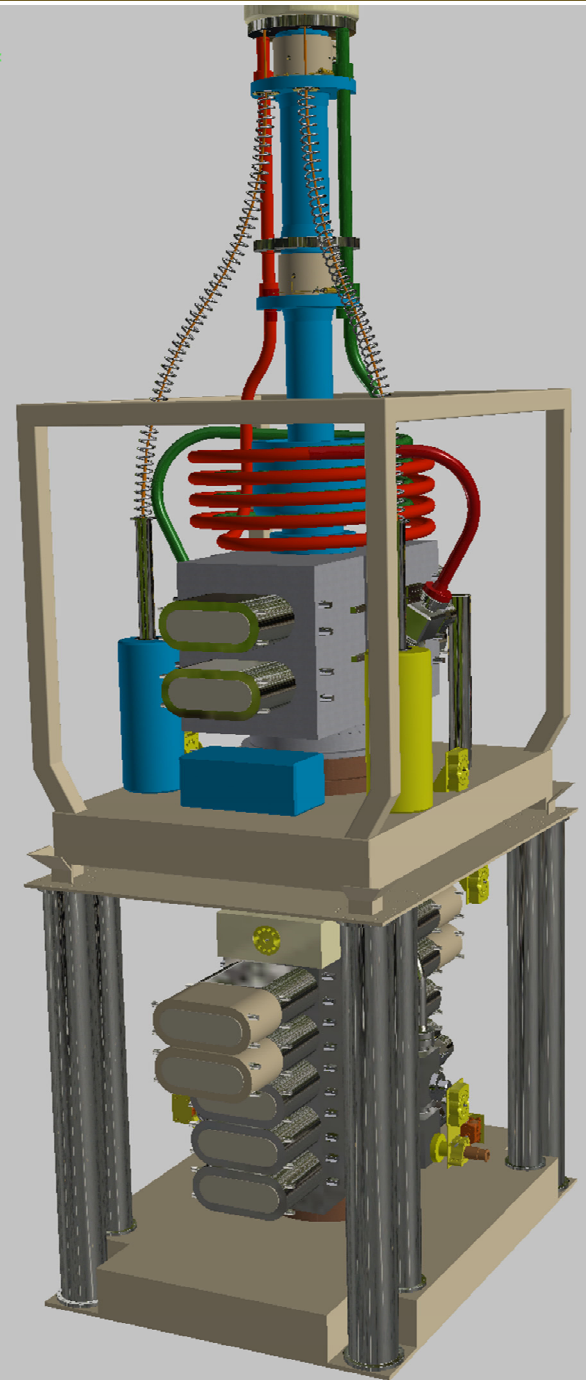
ANNULAR BOP:

1. 18.75" annular capable of 20 K.S.I.
2. Bidirectional annular BOP - at 20 K.S.I.
3. 20 K.S.I. shared differential using 2 - 10 K.S.I. annulars

MISCELLANEOUS CONCEPTS RELATING TO:

1. Wellhead Connector seal ring release
2. Eliminate Choke and Kill Connector
3. Eliminate control pod stab plates
4. Buoyant control umbilicals which a reel can retrieve
5. Eliminate gate valve failsafe spring cartridges
6. Manufacturing techniques

If these inventions are of interest to you,
let us know at the address below.



These inventions available for licensing. They are not current products. Patents Pending.

Baugh Consulting Engineers, Inc. offers a combination of patent licensing, engineering, manufacturing capabilities, and products to assist you grow your business.

Primary Contact: Benton F. Baugh, Ph.D., P.E., 713-419-8683, bbaugh@baughengrs.com

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PATENTS PENDING

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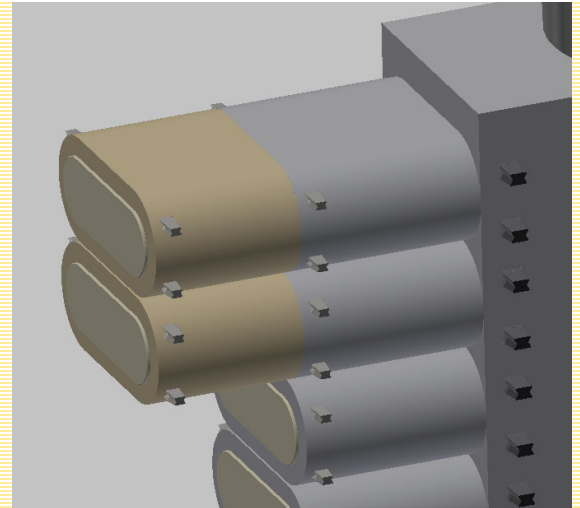
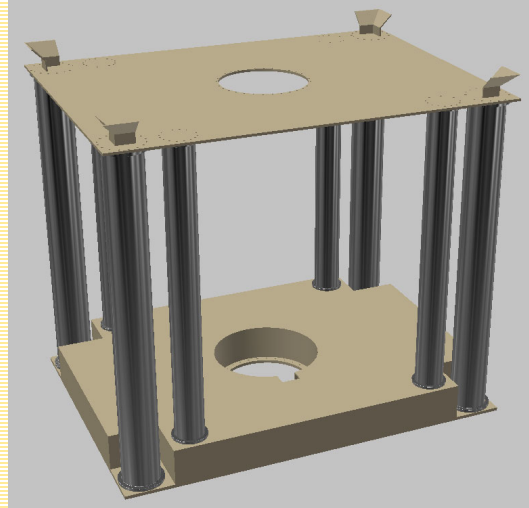
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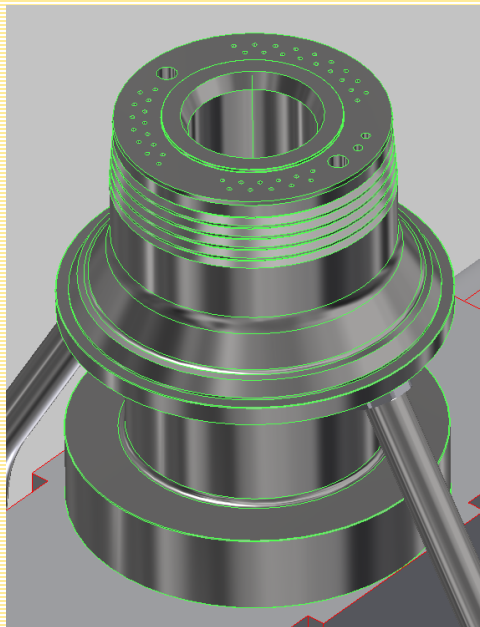
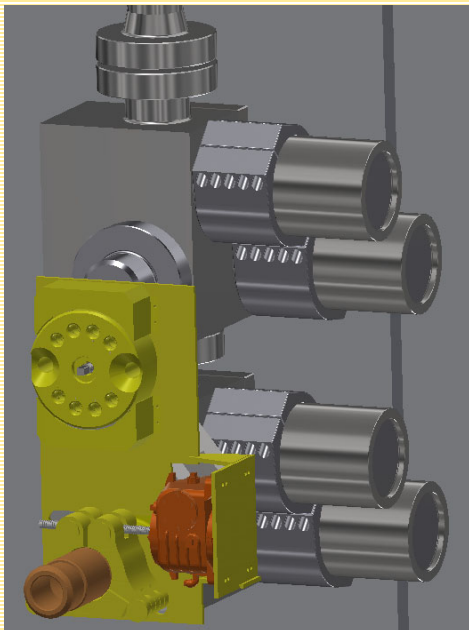
THICK WALLED
DEPTH COMPEN-
SATED ACCUMULA-
TOR TANKS BECOME
THE PRIMARY STRUC-
TURE.

150 GALLONS OF
WORKNG FLUID
SHOWN.

SIMPLIFIES STACK.



BOP ACTUATOR BOLTING
ELIMINATED, FULLY PRE-
LOADED CONNECTION



CHOKE LINE, KILL LINE,
AND CONTROL LINES
TAKEN THRU THE LOWER
BOP STACK MANDREL.

ELIMINATES OTHER CON-
NECTIONS AND MOMENTS
ON THE LMRP CONNECTOR

3" - 20,000 K.S.I. FAILSAFE ACTUATORS SHOWN
TO SCALE, PLUS YELLOW ROV KILL LINE ACCESS

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