SCOUT Class Preview Product Demonstration
Inner Space: Rigs to Reefs

An oil platform in the Gulf of Mexico's Green Canyon lease block #272 no longer produces enough oil to make it economically feasible to continue drilling operations. The plan is to decommission the platform and turn it into an artificial reef. Before removing the top of the platform and converting the base into an artificial reef habitat, the oil well must be capped.

Your company is tasked with securing a cap to the wellhead. This task involves installing a cap and securing it onto the wellhead with a bolt.

This task involves the following steps:

- **Retrieving the wellhead cap from the elevator – 10 points**
- **Installing the cap over the wellhead – 10 points**
- **Retrieving the bolt from the elevator – 10 points**
- **Securing the cap to the wellhead with one bolt – 10 points**

Production Demonstration Notes:
The steps of the Rigs to Reef task must be done in order. The cap must be installed over the wellhead before the bolt is retrieved from the elevator. Companies may not attach the bolt to the wellhead cap first.

Both the cap and the bolt will be positioned on an elevator platform located on the bottom of the pool. The elevator platform will be located within 1 meter of the wellhead.

Companies must retrieve the wellhead cap from the elevator. The wellhead cap will be constructed from a 4-inch PVC end cap. Flotation on the inside, top of the cap will reduce the weight of the end cap in water. Companies will receive 10 points when they successfully retrieve the wellhead cap from the elevator. A successful retrieval is defined as the end cap under control of the ROV and no longer touching the elevator or the pool bottom. Pushing the wellhead cap so it falls off the elevator does not count as a successful retrieval.

Companies must then install the wellhead cap over the wellhead. The wellhead will be constructed of a ½-inch PVC framework. The top of the wellhead will be constructed from a 3-inch to 2-inch converter. A 2-inch to ½-inch reducer bushing will connect the wellhead framework and the top of the wellhead. Companies will receive 10 points when they install the wellhead cap over the wellhead. Successfully installing the wellhead cap is defined as the cap sitting flush on the top side of the wellhead.

After installing the wellhead cap, companies must retrieve the bolt from the elevator. The bolt will be constructed from a 3-inch knockout cap, and ½-inch PVC. Velcro hooks are located on the bottom of the 3-inch knockout cap. Companies will receive 10 points when they retrieve the bolt from the elevator. A successful retrieval is defined as the bolt under control of the ROV and no longer touching the elevator or the pool bottom. Pushing the bolt so it falls off the elevator does not count as a successful retrieval.

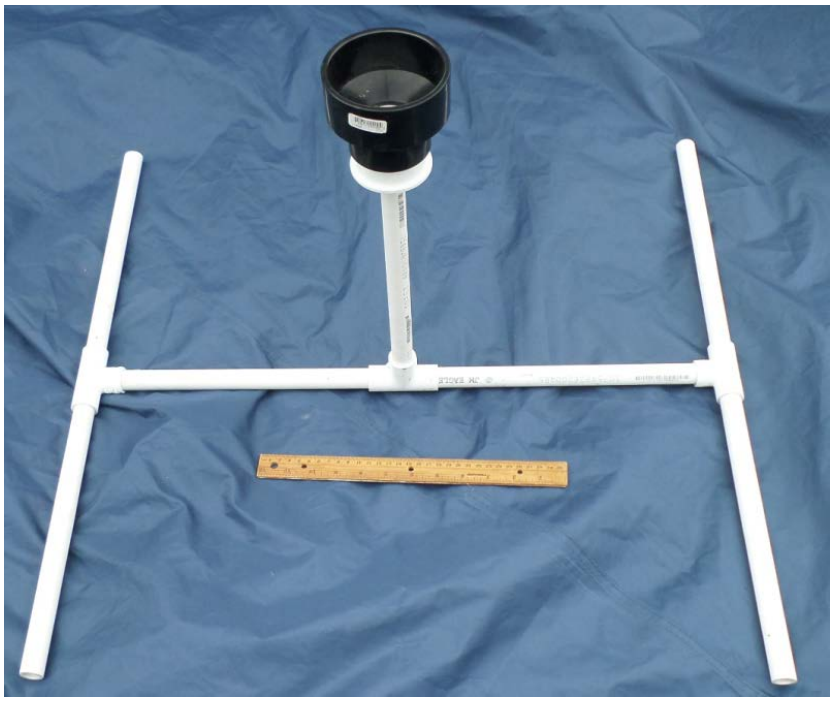
Finally, companies must secure the wellhead cap by placing the bolt on top of the cap. The Velcro hooks on the bottom of the bolt will attach to the Velcro loops on the top of the wellhead cap. Companies will receive 10 points when the bolt is placed and the cap is secured to the wellhead. Successfully securing the cap to the wellhead means that the Velcro hooks on the bolt are secured against the Velcro loops on the cap. The bolt must stay on the cap and the cap must stay on the wellhead for at least 5 seconds after the ROV releases the bolt.

PROP BUILDING INSTRUCTIONS & PHOTOS

Wellhead

The wellhead framework is constructed from ½-inch PVC pipe. The top of the wellhead is a 3-inch to 2-inch ABS adapter (Home Depot model # 02950H, internet # 205002023, Store SKU # 232521). A 2-inch to ½-inch reducer bushing (Home Depot model # C437-247, Internet # 100343810, store SKU # 744724) connects the adapter to the ½-inch PVC framework. To construct the wellhead:

1. Cut seven 30 cm lengths of ½-inch PVC pipe. Insert one 30 cm length of PVC pipe into the middle opening of a PVC tee. Install the 2-inch to ½-inch reducer bushing onto the other end of this 30 cm length of pipe. Attach the 3-inch to 2-inch adapter onto the other end of the reducer bushing.
2. Insert two 30 cm lengths of pipe into the two remaining side openings of the PVC tee. Attach the middle opening of a ½-inch PVC tee to the ends of the two 30 cm lengths of pipe.
3. Insert four 30 cm length of ½-inch pipe into the four side openings of the two PVC tees.



SCOUT product demonstration build photo #1: The wellhead.

Wellhead cap

The wellhead cap is installed on top of the wellhead. The wellhead cap is constructed from a 4-inch PVC end cap. Velcro loops are located on the top of the cap. A 40 cm length of 1/8-inch nylon rope (Home Depot model # 14068, internet # 202048182, Store SKU # 140287) serves as a lift point for the wellhead cap. To construct the cap:

1. Cut two 8 cm x 5 cm lengths of Velcro loops. Adhere these rectangles of Velcro to the top of the 4-inch end cap.
2. Drill two 3/16-inch holes in the top of the end cap between the two rectangles of Velcro loops.
3. Drill two 3/16-inch holes on opposite sides of the sidewall of the 4-inch end cap. The two holes should be 0.5 cm from the top rounded edge of the end cap.
4. Cut a 40 cm length of 1/8-inch nylon rope. Insert the ends of the nylon rope through the two holes drilled into the sidewalls of the end cap. Tie an overhand knot to keep the rope secured inside the end cap.

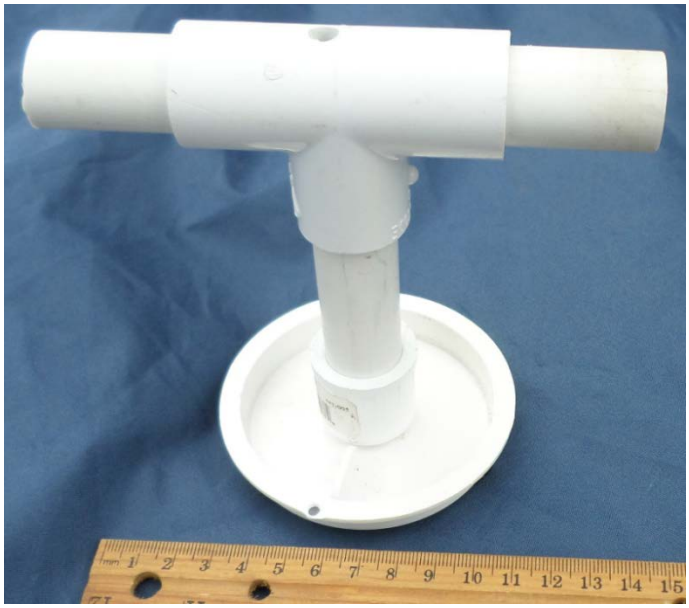
SCOUT product demonstration build photo #2: The wellhead cap.

Bolt

The bolt is connected to the top of the wellhead cap to secure the cap onto the wellhead. The bolt is constructed from a 3-inch knockout cap (Home Depot model #39102, Internet #100122751, Store SKU #508260) and ½-inch PVC pipe. Velcro hooks secure the bolt to the Velcro loops on the wellhead cap. To construct the bolt:

1. Screw a ½-inch PVC end cap in the center of the inside edge of a 3-inch knockout cap.

2. Cut an 8 cm length of ½-inch PVC pipe. Insert this pipe into the end cap. Install the middle opening of a PVC tee to the other end of the 8 cm length of pipe.
3. Cut two 5 cm lengths of ½-inch PVC pipe. Insert these two lengths of pipe into the side openings of the PVC tee.

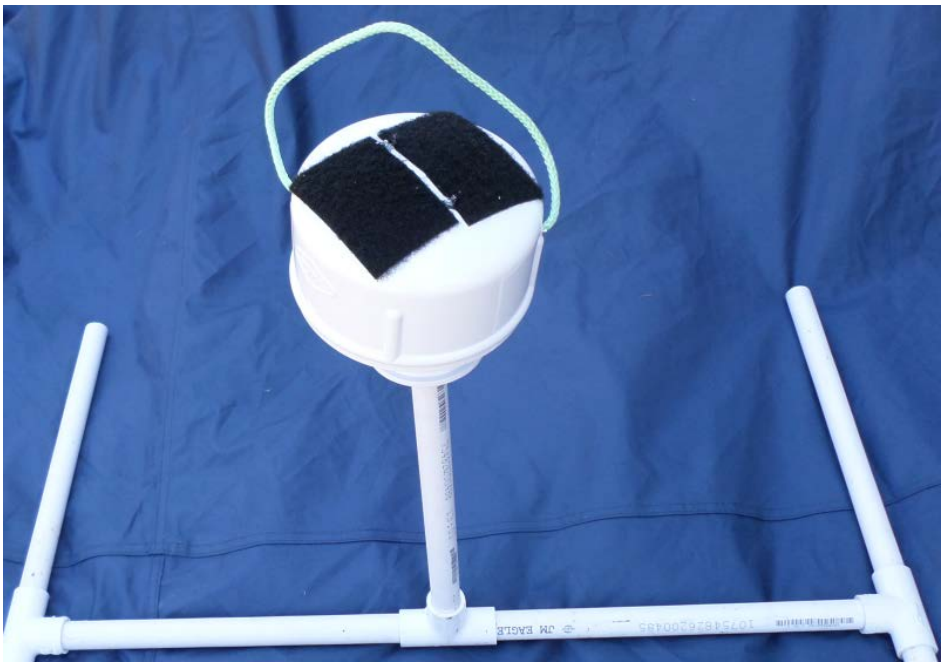


SCOUT product demonstration build photo #3: The bolt.

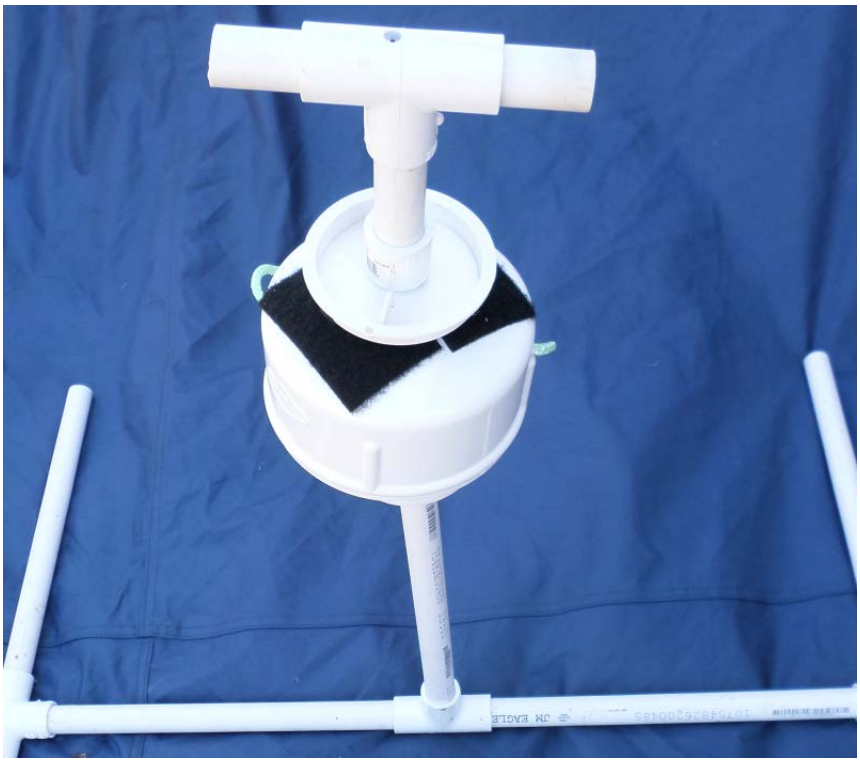
4. Cut an 8 cm x 5 cm length of Velcro hooks. Adhere the Velcro rectangle to the outside bottom of the 3-inch knockout cap.

SCOUT product demonstration build photo #4: Velcro hooks on bottom of bolt.

PRODUCT DEMONSTRATION PHOTOS



SCOUT product demonstration photo: The cap installed on the wellhead.



SCOUT product demonstration photo: The bolt secured to the top of the wellhead cap.