



U. S. Chemical Safety and Hazard Investigation Board RECOMMENDATIONS STATUS CHANGE SUMMARY

Report:	Macondo Blowout and Explosion
Recommendation Number:	2010-10-I-OS-R4
Date Issued:	June 5, 2014
Recipient:	American Petroleum Institute (API)
New Status:	Closed – Acceptable Action
Date of Status Change:	January 20, 2021

Recommendation Text:

Revise Blowout Preventer Equipment System for Drilling Wells (API Standard-53, 4th edition) to establish additional testing or monitoring requirements that verify the reliability of those individual redundant blowout prevention systems that are separate from the integrated system tests currently recommended.

Board Status Change Decision:

A. Rationale for Recommendation

On April 20, 2010, a multiple-fatality incident occurred at the Macondo oil well approximately 50 miles off the coast of Louisiana in the Gulf of Mexico during temporary well-abandonment activities on the Deepwater Horizon (DWH) drilling rig. Control of the well was lost, resulting in a blowout; the uncontrolled release of oil and gas (hydrocarbons) from the well. On the rig, the hydrocarbons found an ignition source. The resulting explosions and fire led to the deaths of 11 individuals; serious physical injuries to 17 others¹; the evacuation of 115 individuals from the rig; the sinking of the Deepwater Horizon; and massive marine and coastal damage from approximately 4 million barrels of released hydrocarbons.

As a part of its investigation, the U.S. Chemical Safety and Hazard Investigation Board (CSB) examined the conditions that lead to the failure of the rig's blowout prevention (BOP) equipment systems² as well as the regulatory and industry consensus standards governing their inspection and maintenance. The CSB determined that one of several causes that led to the

¹ The injury numbers presented here match those reported to the US Coast Guard as required by 33 C.F.R. § 146.30 on form CG-2692 Report of Marine Accident, Injury or Death. The 17 physical injuries represented here reflect the individuals that received immediate hospitalization as a result of the incident.

The actual number of injured from the Macondo incident is somewhat ambiguous, as a number of additional individuals sought medical treatments in the weeks following the blowout. In December 2014, Transocean noted 63 bodily injury claims pending in the state and federal courts in Louisiana and Texas. [Form 10-K Annual Report, 2014, pp 100, <http://phx.corporateir.net/External.File?item=UGFyZW50SUQ9NTcxMDc3fENoaWxkSUQ9MjcyMzk1fFR5cGU9MQ==&t=1> (accessed March 26, 2016)]

² Blowout prevention equipment systems include: blowout preventers, choke and kill lines, choke manifold control systems, and auxiliary equipment.

failure was lack of effective testing or monitoring of the deadman system³. This separate, redundant, emergency system was designed to activate a blind shear ram (BSR) within the BOP to shear drill pipe and seal the well in the event of a catastrophe, such as a fire and explosion.

The CSB investigation report concluded that the existing industry standard on blowout preventers, American Petroleum Institute (API) Standard 53 (4th edition), did not provide sufficient testing or monitoring requirements to verify the reliability of individual redundant blowout prevention systems. As API is actively engaged in developing industry standards for the offshore industry in the United States, the Board issued a recommendation to API to establish additional testing and monitoring requirements for these BOP systems.

B. Response to the Recommendation

In February 2020, API reported to the CSB that it had revised and published the fifth edition of API Standard 53, *Well Control Equipment Systems for Drilling Wells*. In its response, API explained how the fifth edition of this standard satisfies the CSB recommendation. Namely that:

- Dedicated emergency accumulators and the deadman system are now required to be tested at initial latch-up to the subsea wellhead, and
- High-pressure casing shear ram and the high pressure blind shear ram close circuits are now required to be function tested once every 90 days
- Methodologies and acceptance criteria for the above tests are outlined in tables in Annex C of the standard.

The CSB obtained and reviewed the fifth edition of API Standard 53 to verify the information provided in API's response.

C. Board Analysis and Decision

As the above changes to the fifth edition of API Std. 53 appear to satisfy the intent of the CSB recommendation, the Board voted to change the status of CSB Recommendation No. 2010-10-I-OS-R4 to: "Closed – Acceptable Action."

³ A system designed to automatically shut in the wellbore in the event of a simultaneous absence of hydraulic supply and control of both subsea control pods