



**Investigation of Fatal Fall  
Through “V” Door  
South Pass Block 62  
OCS-G 01294  
June 15, 2002**

**Gulf of Mexico  
Off the Louisiana Coast**



**U.S. Department of the Interior  
Minerals Management Service  
Gulf of Mexico OCS Regional Office**

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**Jack Williams - Chair  
Lynard Carter  
Stephen Lucky**

## **Contents**

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### **Investigation and Report**

- Authority, 1
- Procedures, 2

### **Introduction**

- Background, 4
- Brief Description of Accident, 4

### **Findings**

- Preliminary Activities, 5
- Description of Incident, 6
- Subsequent Activities, 7
- Investigation of Physical Factors, 7
- Locking or Fastening of Gate, 9
- Regulations Covering V-door Fasteners, 9
- OSHA and IADC Advisories and Regulations, 10

### **Conclusions**

- The Accident, 14
- Cause, 14
- Contributing Causes, 14

### **Recommendations**

- Safety Alert, 15
- Regulations Study, 16

### **Appendix**

- Attachment 1, – Location of Lease OCS-G 01294, South Pass Block 62.
- Attachment 2, – View of Rig Floor, Derrick Heels, V-Door, Path of Fall.
- Attachment 3, – View of V-Door Gate, Derrick Heel, Post Used as Brace for Derrickman.
- Attachment 4, – View Looking Down from Rig Floor to Wire Spool Impact Point.
- Attachment 5, – View from Rig Floor
- Attachment 6, – Close View, V-Door Gate.
- Attachment 7, – Close View, Gate Fastener and Lock Hole.

## **Investigation and Report**

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**Authority** On 17 June 2002, the platform workover rig *Pride 14* (hereinafter referred to as the “Rig”) was being erected on the “D” platform, South Pass Block 62 (hereinafter referred to as the “Platform”) (*see Attachment 1 for location*) by employees of the contractor company, Pride Offshore (hereinafter referred to as the “Contractor”). The rig was being erected preparatory to conducting workover operations on four South Pass Block 62 wells for operator Apache Corp. (hereinafter referred to as “Operator”).

While the derrick was being raised, a gate across the V-door inadvertently opened. The driller, who was apparently braced against that gate, fell backwards, lost his hard hat, and was fatally injured when he impacted equipment on the lower level, 19 feet below the rig floor.

The event occurred 17 June 2002 at approximately 0010 hrs on the Operator’s Lease OCS-G 01294, South Pass Block 62 in the Gulf of Mexico, offshore the State of Louisiana. Pursuant to Section 208, Subsection 22 (d), (e), and (f), of the Outer Continental Shelf (OCS) Lands Act, as amended in 1978, and the Department of the Interior Regulations 30 CFR 250, the Minerals Management Service (MMS) is required to investigate and prepare a public report of this accident. By memorandum dated 24 June 2002, the following personnel were named to the investigative panel:

Jack Williams, Chairman – Office of Safety Management, FO, GOM  
OCS Region

Stephen Lucky – New Orleans District, Field Operations, GOM OCS  
Region

Lynard Carter – New Orleans District, Field Operations, GOM OCS  
Region

**Procedures** On the morning of 17 June 2002, personnel from the MMS New Orleans District visited the site of the accident to assess the situation, initiating MMS's investigation of the incident.

On 2 July 2002, the crew of the rig on tower at the time of accident were interviewed in the New Orleans District office of MMS by the investigation panel. In addition to the interviews, other information was gathered at various times from a variety of sources. This information included the following reports and statements:

- Interviews, notes and tapes, of the derrickman, floorhand, and night tool pusher;
- MMS Serious Injury Report from the contractor, documenting the fatality and injury;
- USCG accident forms CG-2692;
- USCG-gathered (day of incident) written statements from the derrickman and night tool pusher;

- Rig and platform layout diagram;
- OSHA, IADC and API recommended standards for fall protection;
- Pictures of equipment, layout and orientation of rig and platform and
- The rig Job Safety Analysis (JSA) for erecting the derrick.

## **Introduction**

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**Background** Lease OCS-G 01294 covers approximately 5,000 acres and is located in South Pass Block 62, Gulf of Mexico, offshore, Louisiana. (*For lease location, see Attachment 1.*) The lease was issued effective 1 June 1962, and Apache was last designated operator of the lease on 16 July 1999, effective 1 March 1999. The lease is 100 percent-owned by Apache Corp.

**Brief Description Of Accident** On 17 June 2002, the rig was being erected on the platform preparatory to initiating a series of four workovers. The process of erecting the rig had advanced to the stage of raising the derrick. As the derrick was being raised by hydraulic jacks operated by the tool pusher, the other four men of the crew were assisting by guiding the heel sections of the derrick into wells below the rig floor where the derrick would be pinned in place.

As the heel sections were passing through the floor slots, a gate barring the V-door inadvertently opened. When the gate opened, the driller, who was apparently braced against the gate while pushing the derrick heel into place, fell backwards. The driller's hardhat came off and he fell 19 feet from the rig floor to the platform level, striking a wire spool with his head. The impact caused the death of the driller.

## Findings

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### Preliminary Activities

At 0010 hours, the crew was erecting the platform rig on the platform after moving it from the “C” platform, preparatory to conducting workovers on wells D-1, D-25, D-33, and D-35. Weather conditions were fair, partly cloudy with visibility of five miles and air temperature of approximately 80 degrees. The wind was from the east at approximately five knots per hour with seas running about two feet.

The rig, *Pride 14*, replaced a rig that had been working in the field for several months and had been sent in for repairs and stacking. The crew assigned to the Rig had been working continuously in the South Pass 62 Field for at least three months. The Rig, while new to some of the crew, had been previously manned by the driller for a number of years.

Written statements indicate that a five-man crew, the nightshift, had been rigging up since approximately 1800 hours. At approximately 0010 hours, the next step in the rig-up process was to raise the derrick by hydraulic jacks. To raise the derrick fully, the derrick heel extensions had to pass through slots in the rig floor (*see Attachment 2*) to pad eye brackets located in wells three feet below the rig floor. Once fully raised, the heel extensions were to be pinned into place on the pad eye brackets. At the pre-job safety meeting, the driller briefed the others about this particular operation and discussed the job hazard analysis (JHA) and the written job safety analysis (JSA).



The driller told the crew to be aware that the derrick heel extensions tended to hang up on the rig floor walkways while passing through the slots on the rig floor. He instructed the crew in the use of pry bars to guide the heel extensions into the wells. In addition to the driller, the crew raising the derrick consisted of the tool pusher, the derrickman, and two roughnecks, R1 and R2.

**Description  
of Incident**

The toolpusher was working the hydraulic lifts, while the driller and derrickman were guiding the right-side heel extension. The two roughnecks, R1 and R2, were guiding the left-side heel extension into the floor well. The left heel extension was known to bind on the rig floor walkway, so R1 and R2 had a pry bar to assist the passage of that heel. The derrickman and apparently the driller were braced on the right-side handrails, pushing the right heel extension to guide it into the proper floor well. The derrickman was braced against the handrail post connecting the fixed handrail with the gate that closed off the right-side V-door (*see Attachment 3*). The driller was apparently braced against the right-side V-door gate. The distance from the heel of the derrick to the railing and V-door gate is approximately 28-30 inches and the top of the V-door gate is approximately 4 feet, 1 inch from the rig floor.

The tool pusher was slowly raising the derrick as the crew guided the heel sections into place, when the right-side V-door gate suddenly and inadvertently opened. The driller, who apparently was braced against the gate, fell backwards off the rig floor through the V-door, losing his hard hat. He impacted upon a wire rope spool on the deck 19 feet below the rig floor, resulting in his death (*see Attachment 2, path of fall, and Attachment 4*).

**Subsequent Activities**

The operation was shut down, and the company man and day tool pusher were called. After running down to check on the driller, the tool pusher returned to the controls of the hydraulic lift and laid the derrick back down in its headache cradle. The Coast Guard and a Med-Evac were called while CPR was administered to the driller. Due to inclement weather conditions, Med-Evac was unable to respond. When the Coast Guard arrived, the driller was evacuated from the rig and taken to East Jefferson Hospital, where he was pronounced dead.

**Investigation of Physical Factors**

When inspectors from MMS examined the rig floor and investigated the circumstances of the accident, it was found that the rig floor was surrounded by standard railings and kick boards except at two locations. These locations were the V-doors, one on either side of the rig derrick, which are routinely used to hoist equipment, pipe, etc. onto the floor for use in rig operations. Both of the V-doors were equipped with double gates made of pipe constructed to handrail standards, except that the lower rail was slightly higher from the rig floor than standard rail construction. These gates are hinged from posts attached to the guard rail posts and are constructed so as to swing outward when opened, much like a double door. The top bar of the V-door gate was approximately 4 feet, 1 inch from the rig floor, and the gate and handrails were approximately 28 inches from the heel of the derrick. The gates allow the two V-door openings to be closed off when not being used for equipment movement, thus protecting workers from falling through the openings (*see Attachment 3*).

When closed, the V-door gates are kept from opening by a simple hinged connector, hereinafter called the Fastener. This Fastener consists of an 8- inch-

long half-piece of pipe (split lengthwise down the middle) bolted to the top rail of one of the gates so that, when lowered, it overlaps about 4 inches of the top rail of both gates (*see Attachment 5, 6, and 7*). When in place, it thus prevents either gate from opening. The Fastener is not positively latched by any automatic mechanism and relies on its weight to stay in place. However, when the mechanism was constructed, provision was made to lock the fastener in the closed position by inserting a pin or pad type lock through a hole through two tabs attached to opposing sides of the Fastener pipe (*see Attachments 6 and 7*). While the derrick was being raised, the left-side V-door gate was closed and secured from opening with the fastener locked in position by a pin through the tab holes. The right-side V-door gate was closed and the gate held shut by the lowering of the Fastener, but the Fastener was not latched or locked by a pin. Thus, the fastener could be raised and the gate opened by lifting the fastener and pressing outward on the gates.

It is common on rigs during operations occasionally to place a barrier across the V-door(s) when operations do not require the use of the opening(s) to move equipment. When the rig is conducting operations, the V-doors openings are employed to move pipe, tubing, etc. onto or off the rig floor, and the V-door in these circumstances is usually attached to a chute to facilitate operations. Only one V-door is usually required and the other is commonly closed off with a locked barrier. During operations, it is usual for the working V-door to be closed temporarily by different types of barriers, often a simple chain.

**Locking or  
Fastening of  
Gate**

It was found that, prior to the accident, the subject V-door gate that inadvertently opened was held shut by the Fastener. During the initial investigation, an inspector for the MMS demonstrated that this Fastener could be opened inadvertently by simply catching a tab of the Fastener on the clothing of someone crouching next to it. After the tab is caught in such a manner, the act of subsequently standing could throw the Fastener back, allowing the gates to be opened by outward pressure. As noted above, two metal tabs extending below the body of the Fastener at the nonhinged end are pierced by a hole to allow a clip or lock to be placed that would positively lock the gate. The unused V-door on the left side of the derrick was positively locked in such a manner (*see Attachment 6*). However, the right-side V-door gate that subsequently opened was not so positively latched.

Discussions with the Contractor indicate that no formal company policy exists for the locking of the V-door. It was found that the gates were only positively locked if they were expected to be closed for an extended period of time, such as being on the side of the rig that would be unused for hoisting equipment. The JSA that was written for raising the derrick did not mention a danger of falling from the rig floor. It also did not address latching of the V-door gates. A JHA was apparently not written.

**Regulations  
Covering  
V-door  
Fasteners**

The MMS does not have any regulations that address V-door gates, gate latches, or inspection of the same, other than general references to barriers. The investigation team found little in the way of industry guidelines for standards, inspection, maintenance, construction, or repair of V-door gates or barriers.

Researching the literature, the investigators were able to find several industry standard documents that address the requirements associated with handrails, gates, and closures of wall openings (such as the V-door). However, none of these standard documents addresses the specifics of the fasteners or latches required for closures of wall openings, gates, and the like.

**OSHA and IADC Advisories and Regulations**

The MMS investigated the appropriate regulations or best-practice recommendations applicable to gate fasteners. A few Occupational Safety & Health Administration (OSHA), International Association of Drilling Contractors (IADC), or American Petroleum Institute (API) standards address the technical aspects of appropriate barriers for openings, such as V-doors. No references were found that address standards for latching gates. Some of the regulatory/best-practice notes are as follows.

*Guide to Safe Stairways, Walkways, and Railings*, published by the Petroleum Extension Service in cooperation with IADC (Houston, 1978), is a guide to the OSHA specifications governing the construction and location of stairways, walkways, and railings. In this industry guideline, the OSHA specifications have been reorganized and reworded so that personnel involved in the oil-well drilling industry can more easily understand and follow the Federal regulations. The procedures and outlines set forth in this booklet are not intended to replace OSHA specifications but simply to act as a guide to their implementations (preface, p. v).

Figure 7, Rig Diagram of Stairways and Walkways, from this publication shows a typical barrier placed across a V-door opening. In this case, the barrier is a chain. However, no mention of how the chain is to be attached is made in the document

other than it should be designed to meet the OSHA guidelines of withstanding 200 lbs. pressure directed “down” and “out,” but not “up” and “out.”

*OSHA 2098 29 CFR 1926.5* covers fall protection, including specifications for handrails and barriers. Chapter XVII, while not necessarily the controlling authority for offshore operations, is quoted by IADC, API, and other sources when recommending fall protection. In references to the recommendations for fall protection barriers across openings, OSHA 2098 29 CFR 1926.501(b) (3), p. 321, “*Hoist areas*’: Each employee in a hoist area shall be protected from falling 6 feet or more to lower levels by guardrail systems or personal fall arrest systems. If guardrail systems, [or chain, gate, or guardrail] or portions thereof are removed to facilitate the hoisting operations [e.g., during landing of materials], and an employee must lean through the access opening or out over the edge of the access opening...that employee shall be protected from fall hazards....”

*From interpretation, 1926.501(b)(14), p.322:* “*Wall openings:*’ Each employee working on, at, above or near wall openings (including those with chutes attached) where the outside bottom edge of the wall opening is 6 feet or more above lower levels and the inside bottom edge of the wall opening is less than 39 inches above the walking/working surface, shall be protected from falling by the use of a guardrail system, a safety net system, or a personal fall arrest system.”

*1926.501(b)(15), p. 322:* “*Walking/working surfaces not otherwise addressed:*’ Except as provided in *1926.500(a)(2)* or in *1926.501(b)(1)* through *(b)(14)*, each employee on a working surface 6 feet or more above lower levels shall be protected from falling by a guardrail system, safety net system or personal fall

arrest system. (c)(1) Protection from falling objects. (1) Erect toe boards, screens, or guardrail systems to prevent objects from falling from higher levels.”

1926.502(b)(3) “Guardrail systems shall be capable of withstanding, without failure, a force of at least 200 pounds (890 N) applied within 2 inches of the top edge, in any outward or downward direction, at any point along the top edge.”

1926.502(b)(10) “When guardrail systems are used at hoisting areas, a chain, gate or removable guardrail section shall be placed across the access opening between guardrail sections when hoisting operations are not taking place.”

1926.500 definitions, p. 315 – “ ‘Opening’ means a gap or void 30 inches or more high and 18 inches or more wide, in a wall or partition, through which employees can fall to a lower level.”

1926.500 definitions, p. 320 – “ ‘toeboard’ means a low protective barrier that will prevent the fall of materials and equipment to lower levels and provide protection from falls for personnel.”

“(3) ‘Guarding of wall openings.’ (ii) The bottom of a wall opening which is less than 4 inches above the working surface, regardless of width, shall be protected by a standard toe board of an enclosing screen either solid construction or as specified in paragraph (f)(7)(ii) of this section. (3) When a chute is attached to an opening, the provisions of subparagraph (1) of this paragraph shall apply, except that a toe board is not required.”

“(3)(d) ‘Guarding of open-sided floors, platforms and runways.’ (1) Every open-sided floor or platform 6 feet or more above adjacent floor or ground level shall be guarded by standard railing, or the equivalent, as specified in paragraph (f) (I) of this section, on all open sides, except where there is entrance to a ramp, stairway, or fixed ladder. The railing shall be provided with a standard toe board wherever, beneath the open sides, persons can pass, or there is moving machinery or there is equipment with which falling materials could create a hazard.”

“Appendix D DEFINITIONS (O) ‘Wall opening’ – an opening at least 30 inches high and 18 inches wide, in any wall or partition through which persons may fall, such as a yard-arm doorway or chute opening...”

From the above quotations of OSHA standards, it can be reasonably inferred that the V-doors of a rig floor are “wall openings” when the chute is not attached, and “chute openings” when the chute is attached. To date, the OSHA standards are not directly applicable to offshore rigs. However, the OSHA standards are often recognized as industry’s best practices and are so published in industry-supported publications such as the IADC pamphlet quoted above. The MMS investigation was unable to find any OSHA, IADC, and API standards or recommendations for best practices that addressed any requirements for fasteners of wall opening barriers other than the gate be able to withstand 200 lbs. pressure applied down and out. The rig V-door gate does apparently withstand this force when the fastener is in place.



## **Conclusions**

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**The Accident** After a review of the information obtained during the investigation, it is the conclusion of this panel that at approximately 0010 hours, while the derrick on the rig was being raised, the right-side V-door gate, which was fastened but not latched or locked, was inadvertently unfastened in the course of normal work operations. The driller, who subsequently attempted to brace himself on the inadvertently unfastened V-door gate while guiding the rising derrick into place, fell back through the V-door 19 feet to the platform deck below. This fall resulted in the death of the driller.

**Cause** The fatal fall was caused by the inadvertent opening of the V-door gate. This inadvertent opening was allowed because of the unintentional raising of the Fastener, which kept the gates closed, and outward pressure on the gate by the driller, who apparently leaned back against the now unsecured V-door gate. The Fastener was apparently inadvertently raised by the movements of work personnel in the normal performance of their duties. Furthermore, the raising of the Fastener was allowed because of a failure to latch the Fastener positively with a pin or lock.

**Contributing Causes** Contributing to the inadvertent opening of the V-door gate were the following:  
(1) The failure by the Contractor to recognize the possibility of inadvertently opening the fastener and including that danger in the JSA or JHA; (2) The lack of a policy or procedure specifying a positive latch or lock on the V-door gate.

## **Recommendations**

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**Safety Alert** The Gulf of Mexico OCS Region should issue a Safety Alert to read as follows:

Recently, a workover rig was being erected on a platform. As the derrick was being raised by hydraulic jacks, members of the crew were guiding the heel sections of the derrick through slots in the rig floor into wells where the derrick would be pinned in place.

As the heel sections were passing through the floor slots, a gate across the V-door inadvertently opened. When the gate opened, a worker, who was apparently braced against the gate while pushing the derrick heel into place, fell backwards through the V-door opening, falling 19 feet from the rig floor to the platform level. The impact caused the death of the worker.

An MMS investigation concluded that the V-door gate was inadvertently unfastened by the worker in the normal course of work activities. The design of the Fastener for the gate allowed the inadvertent opening because of the following:

- (a) The Fastener was a type that opened by simply raising a connecting mechanism;
- (b) The Fastener was not latched or kept from being raised by any positive catch method;
- (c) The Fastener could be raised by the clothing of a worker catching the mechanism while crouched and then his subsequently standing up.

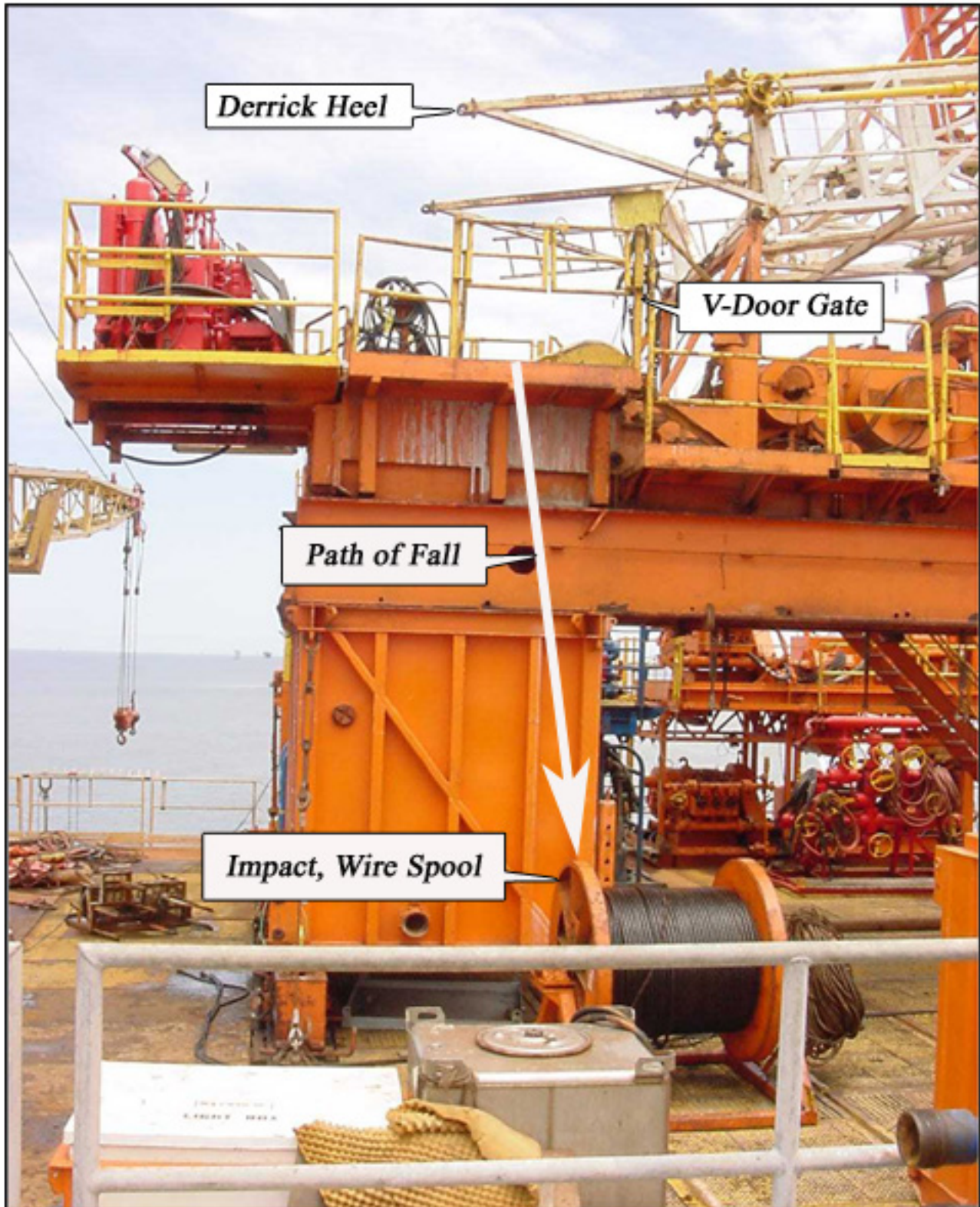
The MMS recommends to the operators that they review the fastening mechanisms on all barriers covering handrail openings on platform or rigs. These barriers include all types of gates and chains. The MMS recommends that the operators consider installing positive latch or catch mechanisms that prevent the inadvertent opening of such barriers in the course of normal work activities.

**Regulations  
Study**

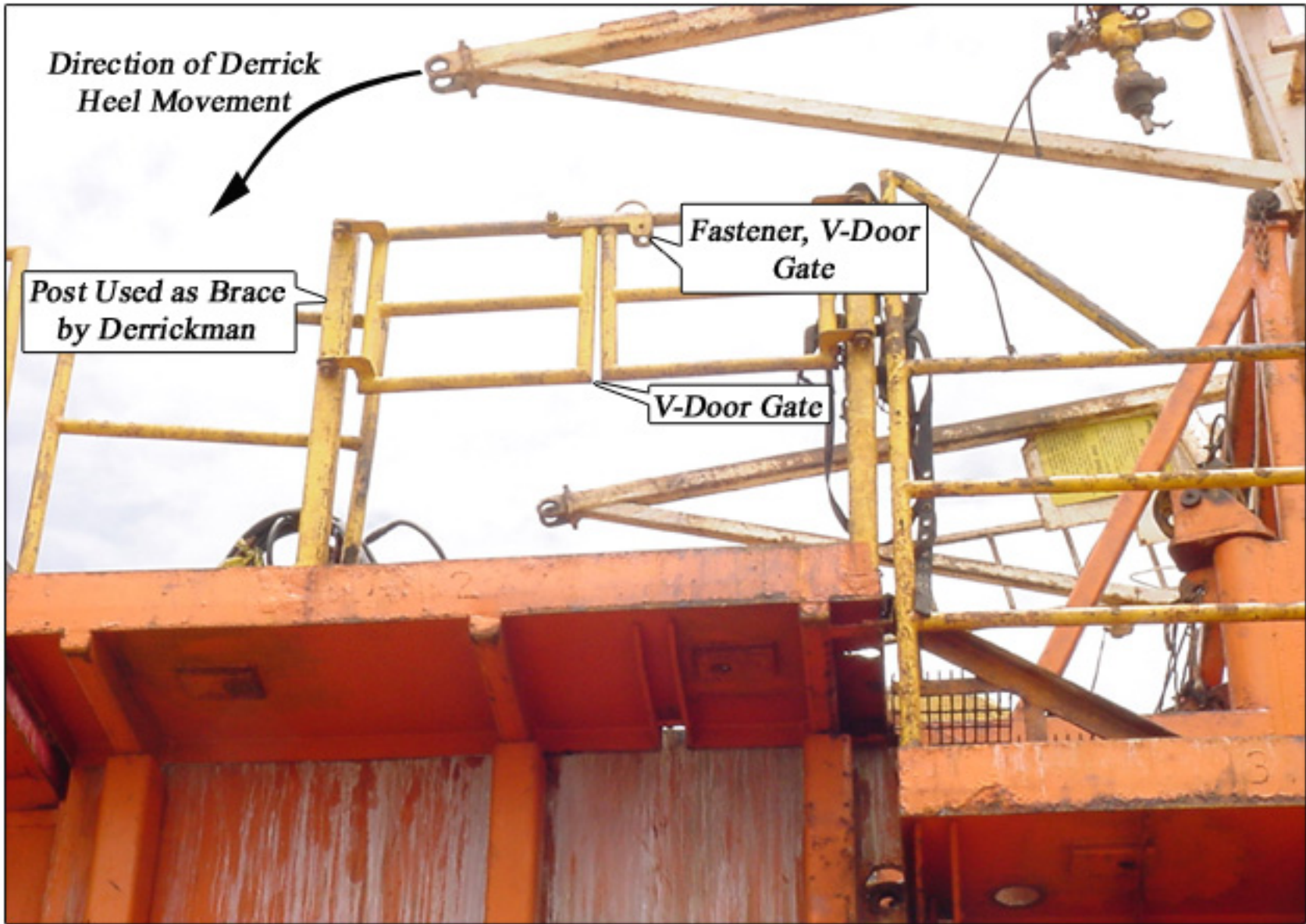
The MMS should review the accident with other regulatory agencies, including Occupational Safety and Health Administration (OSHA), to determine the need for a policy specifying standards for latching V-door gates or other barriers in wall openings.



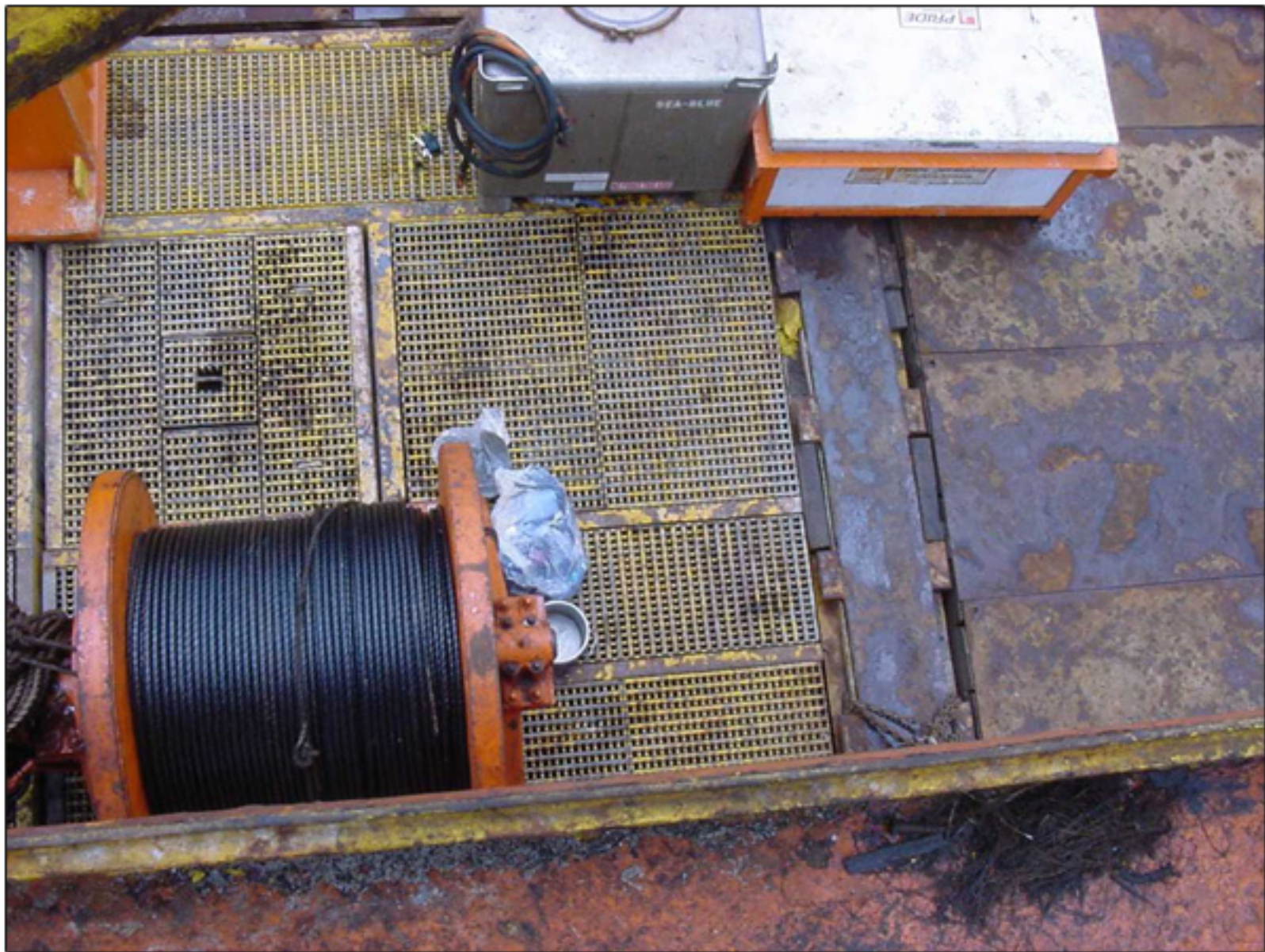
Location of Lease OCS G-01294 South Pass Block 62



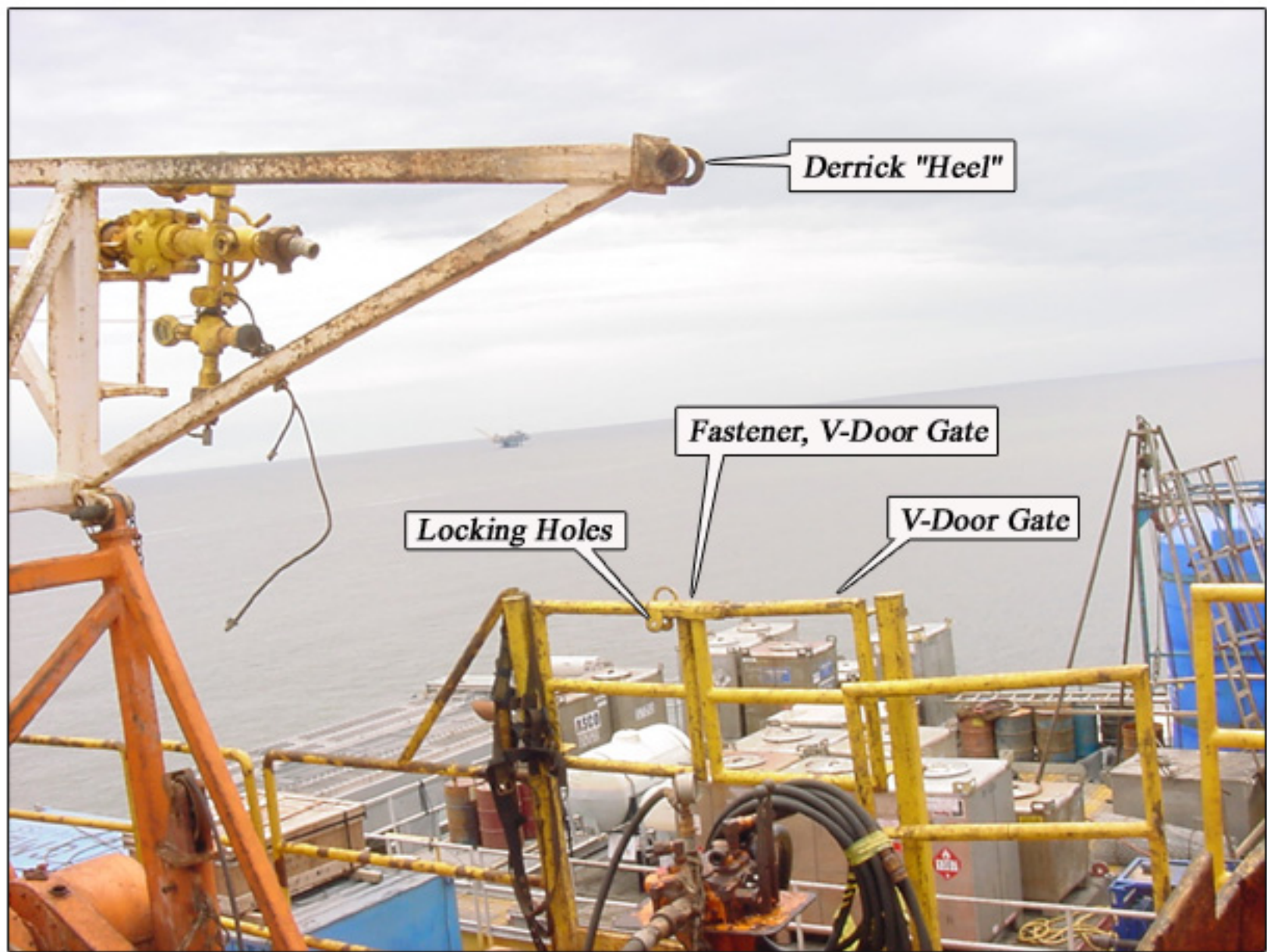
*View of Rig Floor, Derrick Heels, V-Door, Path of Fall*



*View of V-Door Gate, Derrick Heel Post Used as Brace for Derrickman*

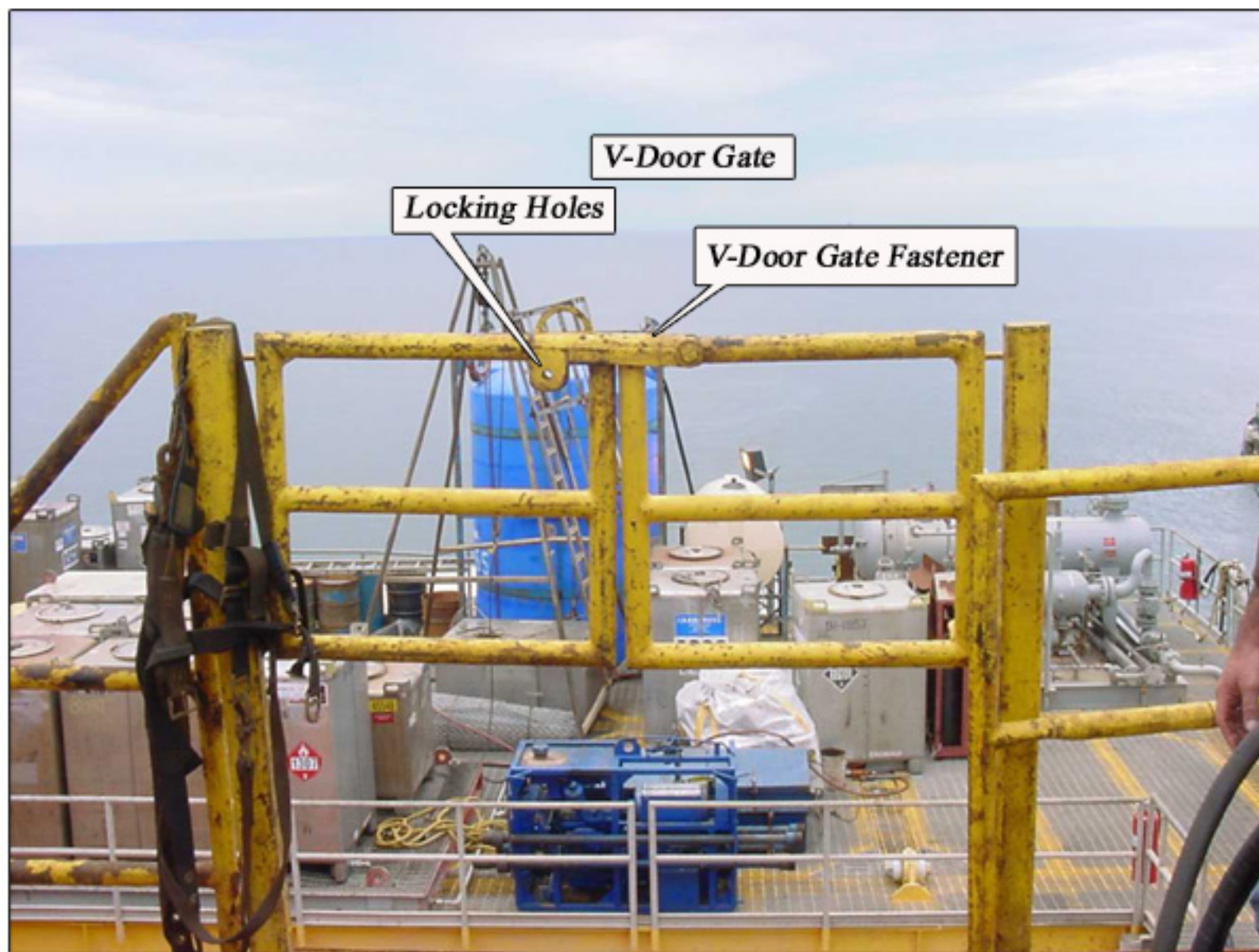


*View Looking Down from Rig Floor to Wire Spool Impact point*



*View from Rig Floor*





*Close View, V-Door Gate*



*Close View, Gate Fastener and Lock Hole*