Seeing danger: Safety on an offshore oil and gas platform

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Abstract

Oil and gas (O&G) production platforms are intrinsically risky environments. They are also highly visual and sensory environments. To manage hazards associated with North Sea O&G extraction operations, organisations responsible expend time and effort to ensure the workers' safety. This article shows how construction workers see and make sense of safety and danger. The setting is an ageing O&G production platform in the North Sea undergoing extensive upgrade. In this rich sensory environment, workers interact with safety by colour, local interpretation, and demarcation of habitats and areas. The nature of the North Sea construction environment demands that they also bodily recognise their own activities as embedded in a larger, dynamically changing workplace where safety is locally produced. In this workplace, safety knowledge is achieved through the platform workers deliberately constructing the environment, outside formal safety guidelines.

INTRODUCTION: SAFETY AND DANGER

This article documents how safety is constructed, both institutionally and in everyday work, by workers at a North Sea Oil and Gas (O&G) offshore platform through ethnomethodologically-informed ethnographic inquiry. Through a close examination of space and everyday

practice on an O&G platform and drawing on Goodwin's concept of professional vision (Goodwin, 1994:606) and his later work on the embodied character of action, interaction and cooperation (2000, 2017), we argue that certain signs and spaces on the offshore platform become "objects of knowledge" (Goodwin, 1994) through them being identified as being areas of note ("domains of scrutiny" (ibid)) around which particular collective practices ("specific activities" (ibid)) are performed in order to achieve safety in their jobs. We also describe the detail of how workers on O&G production platforms read and act on their working environment to achieve safety. While Goodwin (ibid) draws on Foucault's work on discursive practices (Foucault, 1981) to show how safety and its conditions are established, we instead refer to Foucault's work on how the clinic structures sight with relation to truth and evidence and its shaping effect on the normative practices of work (Foucault, 1973). We also, in line with prior, principled studies of the use of space (e.g. Kirsh, 1995) show how space on the platform is constructed as a resource to be read to achieve safety. Crucial to the success of this ongoing, collaborative construction and reading is "having a body" and being spatially located (ibid). We also show the importance of that body being publicly visible to others, senses other than sight and the moving, working body.

Oil and gas (O&G) production platforms are intrinsically risky environments, even if there is a broad consensus within the industry that organisations provide physically reliable and safe equipment, and a framework of processes and procedures for workers to follow (Oil & Gas UK, 2012). In fact, the number of dangerous occurrences tended to decline over the period from 2008-2018 (https://www.hse.gov.uk/offshore/statistics/hsr2018.pdf). There is also an assumption that, when adequate physical and legislative frameworks are in place, and when workers are suitably qualified and experienced, then predictably safe operations should result.

However, exploration and production present technical challenges associated with extracting and safely containing high-pressure hydrocarbons from reservoirs deep below the seabed. As the 1998 Piper Alpha disaster, when 167 North Sea oil workers lost their lives, and the 2010 Deepwater Horizon disaster in the Gulf of Mexico showed, the consequence of things going wrong can be catastrophic; loss of life, large scale environmental impact, and companies facing expensive liability claims and long-term damage to reputation. There is a broad consensus within the industry that organisations provide physically reliable and safe equipment, and a framework of processes and procedures for workers to follow (Oil & Gas UK, 2012).

To manage hazards associated with North Sea O&G operations, the organisations responsible for 'upstream' activities – extracting crude oil and natural gas – expend a lot of time and effort to ensure the safety of workers engaged in operating, maintaining and upgrading infrastructure. On offshore production platforms, flexibility and process reliability are exemplified by the technology that safely contains potentially dangerous hydrocarbons, and in the organisational structure that governs the day-to-day operations of an isolated and self-contained production plant.

In other industries, the use of safety cases has been alleged to have contributed to a "culture of paper safety" as opposed to actual safety (Haddon-Cave 2009). Safety regulations are

provided to workers through documentation and training. Here we can draw a distinction between safety in situ and safety in text. We can, in other words, distinguish, operational documents, those which are "frequently consulted in the course of everyday work" (Harper et al. 2001, p. 243) from other kinds of documents such as signs, labels, etc. That is, workers have to find ways of understanding and applying formal document rules that exist in organisations, and apply them in a manner that results in a legitimized course of action. A case in point is that during the Piper Alpha disaster, a number of events and faults prevented documentation from being followed to the letter. The public address system was damaged in the initial explosion and several managers and supervisors had been killed. Consequently, no orders were given to evacuate the platform. Muster points were rendered inaccessible due to fires. Smoke from fires prevented helicopters from landing. The survivors were almost entirely those who jumped into the sea, disregarding safety procedures.

Our initial and primary emphasis here is on everyday practice and our approach to the visual relates to other senses of seeing and sensing danger. We describe how safety is constructed and achieved by platform workers through sensing. This is in contrast to other organisational studies of safety on O&G platforms (particularly in the North Sea). These studies examine particular features of platform safety and attempt to document and theorize it (Parkes, 1998, 2012; Collinson, 1999; Abimbola, Khan, and Khakzad, 2014; Mathisen and Bergh, 2016). Collinson (1999) for example, argues for linking Goffman and Foucault in the analysis of safety culture. While we draw on the work of Goodwin (1994, 2000, 2017) and Foucault (1973) we do so through considering them as prior studies of work and practice and not for the purpose of theorising.

Other prior research points to general features of reliability, as in the concept of the High Reliability Organisation or HROs (LaPorte and Consolini, 1991; La Porte, 1996; Cox, Jones, and Collinson, 2006; Sutcliffe et al 2017). HROs are characterised as being able to control and reduce the inherent hazards that make high risk organisations prone to catastrophic failure (Rochlin 1993). They are also considered as operating in technologically complex environments in which exceptional safety is an outcome of, among other things, flexibility to deal with equivocal and challenging situations, and being able to demonstrate process reliability, both in the management of technology (La Porte, 1996) and in the cognitive processes that they employ (Weick and Roberts 1993; Weick et al., 1999).

In contrast, this article documents how a particular North Sea Oil and Gas offshore platform endeavours to stay safe, and in fact, how it endeavours to perform safety through seeing and sensing danger/safety. The operational context is that of an end-of-life platform being given a new lease of life by virtue of extensive upgrade (as such, becomes a Lazarus platform). In this Lazarus state, operations on the platform are not guided by routine, but by workers having to attend to the dynamic demands of renewal and change. In this state of flux, rules only offer partial guidance, and workers need to make sense of how to go on in a dangerous construction environment. While safety may be considered, in the abstract, as the control of risks, minimisation of hazards, and the absence of harm, it is unlikely to be at the forefront of a worker's mind when they are engaged in work on the platform. In this sense, safety can

be regarded as a 'dynamic non-event' (Weick 2001, p.25) that has to be accomplished on an on-going basis.

RESEARCH SETTING AND APPROACH

The setting was an ageing O&G production platform in the North Sea 125 miles North East of Aberdeen. At the time of this research the platform had ceased hydrocarbon production activities and was undergoing extensive upgrade to enable field life extension intended to substantially increase its operating life and production output. In other words, the crew were involved in the various technical operations required to bring a former 'dead' platform 'back to life' and back into production. To achieve this, a large programme of works was scheduled, which required the services of extra workers, approximately 300 transient construction workers, above a normal crew level of about 80 personnel. Thus, there was a constant flow of workers from the population of about 300 at any time crossing the bridge between the 'flotel' (floating hotel) moored nearby where they stayed to the to the platform where they worked. As workers rotated regularly on a two week on, two week off basis their working environment, the platform, was likely to change from one rotation to the next.

The platform was relatively small, approximately 40m x 50m, and comprised three main deck levels and a number of intermediate mezzanine decks. These decks effectively contained drilling production and hydrocarbon processing plants, all designed for an area where space is at a premium. In common with other production platforms, the process areas was a labyrinth of pipework, mechanical machinery, and electrical power equipment. In this confined, noisy space, the refurbishment programme meant that intrinsically risky work activities were performed on a 24/7, 365 days-a-year basis. The technical work on the platform involved operational duties, maintenance tasks, or construction work. No single worker could know what technical work was ongoing, including the sole 'Area Authority' who acted as a single-point oversight/control. Jobs started, faltered and stopped and platform workers had to make sense of safety displays and assess whether work was in progress and presented imminent risk/danger. Reading signs, including readouts, warning signs, gauges and displays, was a crucial aspect of achieving safety. Workers had to use their perceptual skills to see potential problems and anomalies. Some displays were fixed (e.g. Figure 2a & 2b below) and part of the platform general safety signage, most likely fitted during construction in the platform construction yard. In this dynamic environment, staying safe also involved ongoing work and attention and relied on workers continually making sense of on-going and emergent hazards arising from tasks both they, and their co-workers, performed.

This research aimed to uncover and document some empirical details of work in a hazardous industry – the UK O&G sector. The objective of this study was to contribute to the understanding of how workers engage with risky and dangerous operations in the context of ageing and degrading offshore infrastructure, in the midst of large-scale construction activities examining how members in these conspicuous settings make sense of safety as they go about performing their day-to-day activities. In contrast to other prior studies of safety in the O&G sector, this research adheres to 'methodological indifference' (Garfinkel 1967) and

places emphasis on everyday practice and the importance of the visual – of 'seeing' danger. It also adopts an ethnographic approach. This allows for exploration of the world as it is understood and enacted by members, and for the collection of data in relation to their particular workplace activities. The first author had past experience working offshore and had developed trusting relationships with relatively senior managers in the research organisation. This trust was sufficiently influential to allow the author to have largely uninhibited access to a range of organisational activities, from observing strategic executive meetings, to engaging with those performing tasks at the production and construction work faces.

The first author collected data both offshore and onshore in the forms of a diary, hand written notes, company-produced documents, audio recordings from formal and informal interviews, photographs, and video from a cohort of predominantly male, company staff and contractors. This data was written into a first version of the account of the achievement of safety on the O&G platform presented below, along with an initial selection of photographs. These photographs were captured in the course of ethnographic work and were progressively ordered and reordered through the analysis (cf. Sharrock and Anderson, 1973) to support the description of the experience of the environment (e.g. Figure 1) and the three specific ways that safety was achieved (Figures 2-5). In this process, the artefacts, signs and bodies in photographs were considered to be a collection of data and their "practical use" (ibid) in the process of achieving safety was the key focus. The initial analysis was further developed by the other authors through re-examining the ethnographic findings and photographs in collaboration with the first author and comparing the results of the initial analysis with other ethnographic studies.

Ethnography views the social world from the standpoint of its participants. Ethnomethodology focuses on members' methods for accomplishing situations through the use of local rationalities. A challenge for the use of ethnography as a method in this setting was that it privileges seeing and listening through explicating the in-the-moment sensemaking taking place and how people meet, talk and document aspects of safety. Thus, the method's emphasis on the examination of places and circumstances where courses of action are constructed, maintained, used and negotiated became a problem.

Conversations have long served as grist for ethnography, either through employing conversation analysis or discourse analysis (Moerman, 1988; Sacks, 1992), through ethnographies situated in conversation-rich environments, or through semi-structured interviews that produce and reflect upon conversation. Conversations have been a crucial resource in many ethnographies. Conversation also involves vision, both on the part of the ethnographer and the participant: noticing, reading, reacting, establishing eye contact, and indicating are some visual gestures which are crucial to conversation.

Ethnomethodology aims to observe and describe the phenomena of everyday life independently of the preconceptions of conventional sociological theories and methods, seeking to uncover the orderliness of ordinary activities, revealing 'an orderliness that is accomplished by social actors, unreflexively taken-for-granted by them and constructed with their common-sense knowledge of social order' (Randall and Rouncefield, 2014). While conventional sociological studies of work may focus on, for example, the division of labour, careers,

power relationships and so on they completely miss *what* actually constitutes working practice; that is, they '"miss" the interactional "what" of the occupation studied' (Lynch, 1993, p.271). From the ethnomethodological standpoint, studies of work; 'are about how people do or achieve what can be seen as, talked about as, witnessed as, characterised as, demonstrated as, displayed as, and the rest, a job of work' (Button, 2012, p.676-9, *original emphasis*). From this perspective, members and their subjective orientations and experiences are central. Observation focuses on the places and circumstances where meanings and courses of action are constructed, maintained, used and negotiated. This approach, which treats work as socially organised, and unpacks how it becomes organised, offers a mechanism that might reveal the ordering and coordination of in-the-moment safe work in the high-risk O&G industry.

This research adopted an *ethnomethodologically-informed* ethnographic approach; an approach that is data driven and which attempts to stay faithful to the observed data (Button, 1991). An *ethnomethodologically-informed* ethnography sets out to explore the world as it is understood and enacted by members independently from the preconceptions of conventional sociological theories and methods, focusing their methods for accomplishing situations through the use of local rationalities (Randall and Rouncefield, 2014). While an ethnomethodologically inspired analysis allows us to assess how North Sea O&G construction workers see and make sense of safety while at work, it is hard to achieve because it is data driven, attempting to stay faithful to *observed* data (Button, 1991), often through seeing and listening. Such ethnographies rely on the spoken word and what is observable because they 'are about how people do or achieve what can be seen as, talked about as, witnessed as, characterised as, demonstrated as, displayed as, and the rest, a job of work' (Button, 2012:676-9). In addition, *ethnomethodologically-informed* ethnography challenges the relevance of concepts like professional vision as inherited. To respond to these challenges, we carefully examine the accomplishment of safety through the ethnographer's embodiment and presence and reflect on the phenomenology of practice, exploring the interdependencies of sensory modalities.

Specifically, we show how ethnomethodologically inspired analysis can examine how everyday, ordinary workplace safety in a high-hazard workplace is achieved not so much by formalised instruction, but rather by interactionally organised practices (Lynch 1993) in a rich *sensory* working environment. We show that any professional vision of danger on the offshore platform under study can't rely on "discursive practices" as articulated by Goodwin but instead is achieved through the situated properties of constructed space and different kinds of seeing, making sense of a dynamic work environment such that safety becomes institutionalized and contained within certain practices. We also show that, in the *absence* of conversation, the body becomes central to workers' perceptual strategies. Collectively these findings concerning safety reveal a separation between institutional vision and vision in practice. One is codified and determined prior to practice; the other is tacit and enacted in practice.

SENSING DANGER/SAFETY

On the oil platform workers used all senses to stay safe. For example, in the event of a hydrocarbon leak, sense of smell, and to a lesser extent sense of taste, served to detect the odour of gas. Senses could, however, be muted (or extended) by the necessary and compulsory wearing of personal protective equipment, such as hard-hats, flameproof coveralls and safety footwear. For workers in regular proximity to contact hazards, such as the sharp edges and extreme heat present during metal cutting and electric arc welding, their sense of touch was limited by the need to wear gloves.

Hearing was also key in sensing danger; within the ambient noise of construction, particular noises, for example those associated with shotblasting and metal grinding, provide specific and important information about nearby hazardous working activities. However, the necessity of wearing foam earplugs or ear defenders, or sometimes both, meant that hearing is attenuated and sensitivity to environmental noises was reduced, even if awareness of strong vibrations and respiratory patterns and thereby personal emotional and physical state (Hockey and Allen-Collinson, 2009), was still present. This generally resulted in verbal communication between workers being performed in an exaggerated manner, often mouth to ear, or accompanied with expansive hand gestures.

While eye protection was worn, the generally clear plastic lenses of 'safety glasses' did not obstruct or substantially degrade vision. This was essential as vision, along with proprioception, more than any other sensory modalities, was needed to make sense of environmental conditions that might immediately compromise safety. In the flux of construction activities, workers were faced with an on-going stream of visual stimuli that presented interpretation and sensemaking challenges necessary to inform decision-making. As with many work practices, the way workers saw and made sense was deeply informed by expertise and occupational norms: 'Ways of seeing are structured and mediated by cultural forms and specific kinds of knowledge, which are in turn informed by the act of seeing itself, in a complex circular process' (Hockey and Allen-Collinson, 2009:225). To a large extent, it was the practices of looking, watching, and seeing that determined which facets of the workplace were given attention to ensure safety in the North Sea working environment.

Key to platform workers being able to sense safety was their awareness of their bodily position and movement through their work environment: proprioception. How their bodies were related to things in space, other workers and, crucially, safety signs was part of knowing and conforming to normative limits: 'work involves haptic interaction with the occupational 'terrain', whether that be (literally) the factory floor or the sea, and with equipment, ranging from huge objects such as fishing vessels and earth-moving diggers, to smaller items such as the finely graded brushes of make-up artists' (ibid:227). Platform workers engaged with interactions on both scales: plane-specific kinaesthetic awareness was as important as using tools and specific parts of the body, especially hands and feet, to extend and inform the senses. Merleau-Ponty (1962:143) uses three examples of such artefacts that extend the body's 'reach' and thereby the senses: a car, a hat, a stick. He argues these are actually incorporated into the body, such that a 'two-way, embodied relationship' (Hockey and Allen-Collinson,

2009:228) is developed: getting used to these artefects 'is to be transplanted into them, or conversely, to incorporate them into the bulk of our own body' (Merleau-Ponty, 1962:143).

In order to obtain a sensory perspective on work on the oil platform, we firstly describe a typical, everyday scene experienced by an oil platform worker. This scene is described from a first person view and with attention to the platform's rich sensory working environment.

AN INSTANCE OF SENSING DANGER/SAFETY ON AN OIL PLATFORM

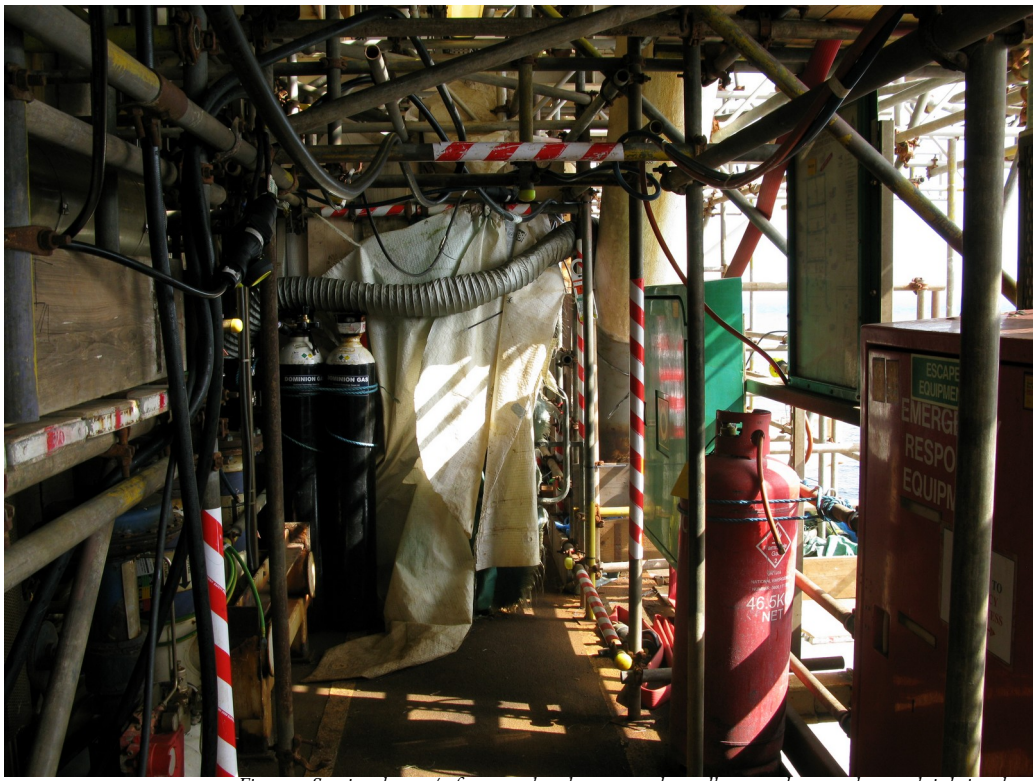

Figure 1: Sensing danger/safety—workers have to read a walkway and assess what work is being done

In this image (Figure 1), a busy yet everyday scene greeted the worker who came across a habitat that encompassed a walkway on the Lazarus platform being studied. The image shows how safety is achieved and danger is perceived in situ: the walkway, bounded by painted lines, was clear but plant and equipment filled both sides. On the right hand side of the image, there was fixed safety related equipment: Emergency Response Equipment in a red fibreglass container, lifebelts in the green fibreglass container, and between these a plan showed the location of platform evacuation routes. A red fire hose passed behind the green container and lay folded beneath; this told workers that the hose was unpressurised and not immediately ready for use. The safety-related uses and potential danger posed by this equipment was recognisable by the platform worker by sight. This 'recognition' was achieved in situ and through training, development and planning associated with safety procedures at the scale of the organisation: much upfront work, such as control of work meetings and on-

site safety assessments, was done to remove, reduce, and control the risks associated with performing physical work. But the image also shows that achieving safety and sensing danger occurred from the embodied and expert perspective of a platform worker's moving body responding to the environment in real-time.

In the forefront of the image, there were visual clues that suggested metal cutting and/or welding were taking place – black oxygen cylinders pointed to the possibility of oxy-acetylene metal cutting, especially since one of the 'bottles' had a pressure-reducing valve connected. The flexible ducting above the oxygen bottles was used for fume extraction in enclosed spaces, so acted as another clue. The green fabric that could be seen behind and below the white nylon tarpaulin was flameproof and again this suggested the hot work of metal burning was taking place. These elements are indicative of a busy work site with specialist equipment packed close together. This was in part because the platform was undergoing maintenance but also because it was relatively small. In such an environment platform workers had to regularly 'read' the presence and arrangement of collections of equipment, as well as signs, while on-the-move.

The tarpaulin, distinguished by its cream colouring, kept rain and sea spray away from the worksite, and it also kept sparks contained and protected against arc eye – a painful eye condition caused by exposure in close proximity to the flash of electric arc welding. The sight of a scaffold gate behind the tarpaulin suggested that work was being done on the other side of the gate. However, there was no immediately obvious Permit to Work (PTW) – a document specifying work being performed and necessary precautions – or other notice that gave warning to keep out. This implied that it was probably safe but there was no obvious direct route, or space, for the platform worker's body to pass and thus this formed a sign either to stop or to turn right to navigate the area.

Looking around, scaffold formed a covered walkway that concealed what was happening nearby. With over 250 tonnes of scaffold on the platform, scaffold structures were pervasive. Clues about whether scaffold was in service could be seen from the scafftag, secured with an electrical cable tie to a scaffold upright, just below the flexible ducting. A glance on passing told if this scaffold was in service, and the gate behind the tarpaulin suggested restricted access. Scaffolders often used red/white tape to warn of horizontal bump hazards at head height, as can be seen above the flexible ducting in the figure. However, this was seldom removed when scaffold was dismantled, which meant scaffold was reused with the warning tape at different heights and orientations. Thus, it was necessary for platform workers to be aware of and change their posture depending on where they were walking or positioned on the platform.

Above, the scaffold was festooned with loosely tied electrical cables and compressed air hoses, indicating these were temporary, construction-specific supplies. Despite being uniformly black, the construction worker could see by size, and could tell by texture and flexibility, the difference between cables and hoses. Again, these provided clues about the work being done in the area and how to position and locate the body; cables provided electrical power to arc welding machines and temporary lighting, and hoses delivered compressed air

for shot blasters and spray painters – providing the motive power for the equipment they used, and supplying breathing air to the respirator hoods that were worn.

To the right side of the walkway, some scaffold tube ends were fitted with yellow plastic push-on caps that were designed to minimise personal injury, but this use was not uniform. In other areas, high visibility scaffpads were fitted to cover some of the exposed ties that held together the uprights, transoms, ledgers, and boards of a scaffold structure. These caps and tags again provided visual cues concerning how to orient the body and approach and move through the area or not. Also, to the right, the red/maroon cylinder by the side of the walkway contained flammable gas supporting the idea that hot work was going on in the area. Like the black oxygen bottles, this was tied in place, and had a pressure reduction valve fitted. However, there was a tail of orange hose exposed, suggesting that this bottle may not have been connected or in service. The blue ropes, along with this hose and the sign reading "Flammable Gas" oriented towards those approaching the walkway all gave indications of safety and danger, supporting the practical action of positioning the body while using the walkway.

On the left of the figure, just below the hop-up scaffold, blue valves can be seen; each had a label with a black arrow and text that states 'LP Flare' (Low Pressure Flare), so was in some way connected to the flare boom that burnt off excessive gas that occured during production. Small-bore stainless steel instrument piping had a multi-coloured tag attached, which shows it was out of service. A green cable could be seen coiled next to the valve and pipework; the crimp tag on its end showed it to be an earth cable, probably disconnected from the LP Flare valve. This arrangement of things, along with the positioning of signs indicated how the worker's body could be positioned with relation to it and how this equipment could be handled safely.

This instance shows that reading, whether it be of documents, readouts, warning signs, gauges and displays, was a crucial aspect of visual safety. Workers had to use their perceptual skills to see potential problems and anomalies (Kerr 2020). All forms of perceiving involve elements of skill and training and are carried out with different levels of expertise (Collins and Evans, 1997:13-17) in initiates.

THREE WAYS OF SEEING DANGER/SAFETY

The three themes below show how everyday scenes like the one presented above engaged and relied on the senses and the body in specific ways.

Safety by colour

Perhaps because the North Sea working environment has an overall, ostensibly grey hue on most days of the year, colour was used extensively on platforms to convey safety messages and central to performing work on the oil platform was being able to see this colour and react accordingly. As well as multiple fixed signs in blue, green, red or yellow offering instruc-

tion or warning (Figure 2a), other permanently located safety equipment used colour to

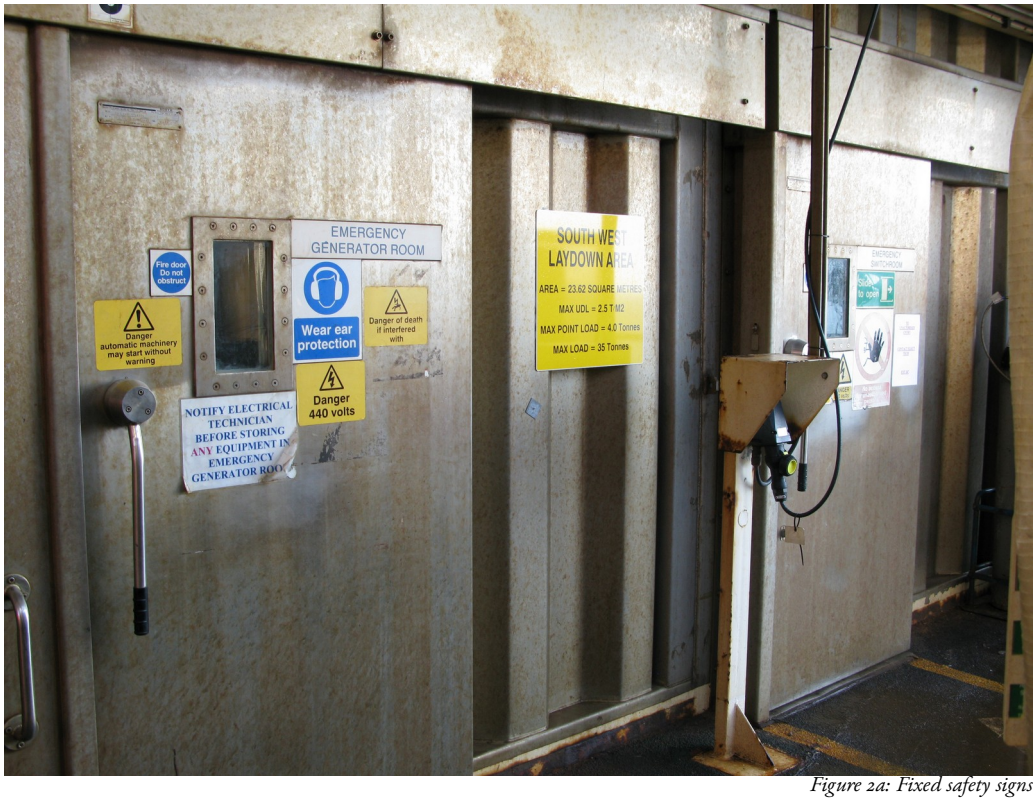

Figure 2a: Fixed safety signs

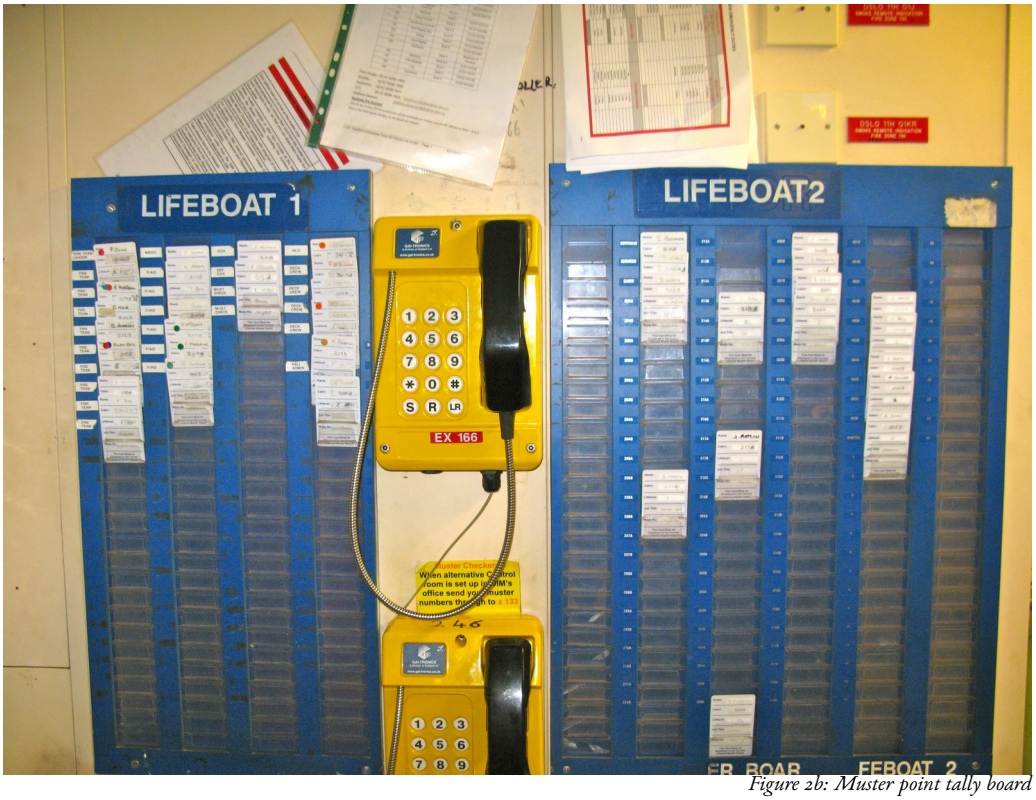

Figure 2b: Muster point tally board

impress importance, e.g. Emergency Shut Down pushbuttons located throughout the platform were coloured yellow, emergency muster points used blue tally boards (Figure 2b), the platform's two davit-launched lifeboats are orange, green cabinets containing lifebelts were widespread on outer walkways, and red fibreglass Emergency Response Equipment stations at multiple points on each level of the platform contained fire fighting equipment.

This colour being situated spatially with particular relation to the working body was essential to it having meaning and ensuring safety. The signs also provided more than navigational instructions, indicating what should be done with the body to maintain safety: to "Wear ear protection" (Figure 2a), to stop unless authorized ("No access for unauthorized personnel", Figure 2a), to read a card or call a number in an emergency (Figure 2b). These visual, colour-based stimuli support plans being carried out. Numerous formal, yet temporary coloured signs presented spatially related safety information; access points on scaffold had yellow and green ladder inspection records and a red, yellow and green scafftag, showing its affordance for safe use (or not) by the working body. Colours were also used on uniquely numbered labels, with blue, red, yellow, and green tear-off tags to show operational status of valves, flanges, and other pipework; these were sometimes accompanied by additional warning labels that informed workers about project status, for example green tags or red labels fixed to valve operating handles. Thus, colour being seen and read in the process of performing everyday work was central to the skill of the platform worker.

Coloured signs could be employed by workers on an ad hoc basis to convey warnings to others and regulate the body's movement. Some were A4 size pieces of white plastic with red overwriting advising 'no access', others were plastic document wallets used to display hand written or typed messages – mostly in red ink, although yellow was also favoured. Often information was ambiguous and required particular expertise, as well as contextual knowledge, to read, such as signs concerning the right to walkway access. While this type of temporary sign tended to have contact telephone numbers and, sometimes, associated names, the general absence of dates made it difficult to assess if the contained message, e.g. 'tripping hazard' was still valid. In an area bristling with pipes, valves, and process equipment, yellow/black painted lines could be seen on a jutting piece of structural steelwork, and red/white tape marked the lower part of an adjacent, large counterweight. Rather than point to all potential bump hazards, these identifiers marked only the most significant obstructions on an informal route and way of orienting the body through a busy process area. On these occasions, relevance could be assessed through examining the broader environmental context of the sign, such as the presence of nearby equipment that suggested on-going work (see below), or clues taken from a weather-beaten nature of a sign suggesting work had discontinued.

Specific, occupationally particular colour was also used to convey occupational status and role, shaping how particular bodies were seen and understood. Banksman and Loadhandlers, both involved in lifting operations, wore high visibility ('high viz') tabards. This was an essential operation on the platform as all goods and materials were lifted on/off supply vessels using cranes. The Banksman, who communicated with both the Crane Driver and the Loadhandler, wore a yellow tabard and a radio belt. The Load Handler, responsible for slinging loads, wore an orange tabard. When seen together, the specific aggregation of colour that the Banksman and one or more Load Handlers created (Figure 3), as well as communicating a significant event in a working day, acted as a warning to workers that overhead crane lifting operations were taking place nearby, again regulating bodily movement and deportment.

Figure 3: Loadhandler and Banksmen being briefed

When overside work was being performed, such as erecting scaffold below or beyond the edge of the platform, those performing the overside work wore yellow watch-style location beacons, designed to activate a distress signal on contact with sea water. On these occasions, a member of the work party was allocated the role of Watchman. The Watchman was distinguished from others (and the broader work environment) by wearing the red tabard associated with this role, as well as being seen to carry two, different frequency, radios: one to communicate with the platform control room, and the other to communicate with the Standby Vessel that maintained a constant vigil 500 metres from the platform. This tabard, taken with the bulk and colour of the radios, not only provided visual information concerning who was in the Watchman role, but also made visible his communicative capability: how his 'reach' was being extended through particular artefects.

Colour was also used to indicate lack of experience, when platform 'new starts', and those who have done less than three 'trips' to the platform in a 12-month period, were given the status of 'Green Hats'. These new starts were also required to wear a green armband on the helicopter flight to the platform, and to wear a green coloured hardhat while at work. This clothing was indicative of particular inexperience: While the green hat indicated unfamiliarity with the particular platform being worked on, it did not necessarily mean limited offshore working experience. Almost all of the 300 transient workers would have worked on other O&G platforms, and many were mature in years and experience. In this way, particular

working bodies were marked out and read as having had a specific temporal relation to the platform and the other workers there.

Safety through local interpretation

Staying safe at the worksite meant that workers had to rely on, as discussed in the previous section, seeing and knowing colour, as well as following procedures, instructions, and workplace rules. This provided workers with rich, context-specific knowledge about safety and the limits of bodily work. But, the day-to-day workplace engagement also required that workers had to regularly use their particular, occupational knowledge to interpret and make sense of others', work tasks, as they were happening around them, work tasks that formed part of the patterned rhythm of working bodies on the platform, even as they transited to and from their own workplaces. In the dynamic, task-laden offshore environment, many temporary worksites overlapped the more permanent platform walkways. Numerous ad hoc methods were employed to advise others of work being done, or the hazards that might be encountered. Instances of this were a notice within a plastic wallet, suspended from piece of cord tied across a walkway, advising of 'No Access', or three signs on an 'Escape to sea' ladder variously warning 'NO ENTRY', 'NO ACCESS', and 'Please exercise extreme caution' (Figure 4a).

These signs were placed by the escape to sea ladder to advise construction (non-platform resident) workers that this particular ladder wasn't a route to the extensive scaffold lattice that had been erected beneath the platform's main deck to aid with the installation of platform support steelwork. Rather, this ladder's sole purpose was to allow personnel to get close enough to the sea so that they could jump in from, say, 10 feet as opposed to the 60-80 foot jump from the platform walkways. If an escape to sea ladder were used in earnest, it might well be because the platform was burning and the lifeboats were not available. This ladder, as well as providing instruction for the body in the case of an emergency, was a chilling reminder that O&G operations had the potential to go badly wrong, and jumping into the sea beneath a burning platform was not something to do lightly. As the Health and Safety Executive (n.d., p.22) note: 'Actually entering the sea should be regarded as the last resort.'

Formal signs and colours offered time-related information that contributed to knowledge of the overall rhythm of work on the platform. Blue, red, yellow, and green tear-off tags indicated temporal information about current safety, and told of progression towards eventual return to service; from breakout to reassembly, through tightening of bolts, leak testing, and being fit for return to service. Other green labels, fixed to plant items using electrical cable ties, showed 'Outage Activity', indicating that equipment was out of service as part of a planned, time-bound plant shutdown. There was also a temporal aspect to the colour of some equipment. For example, lifting slings that were in testing were identified as being fit for use by colour, with the colour coding changing monthly.

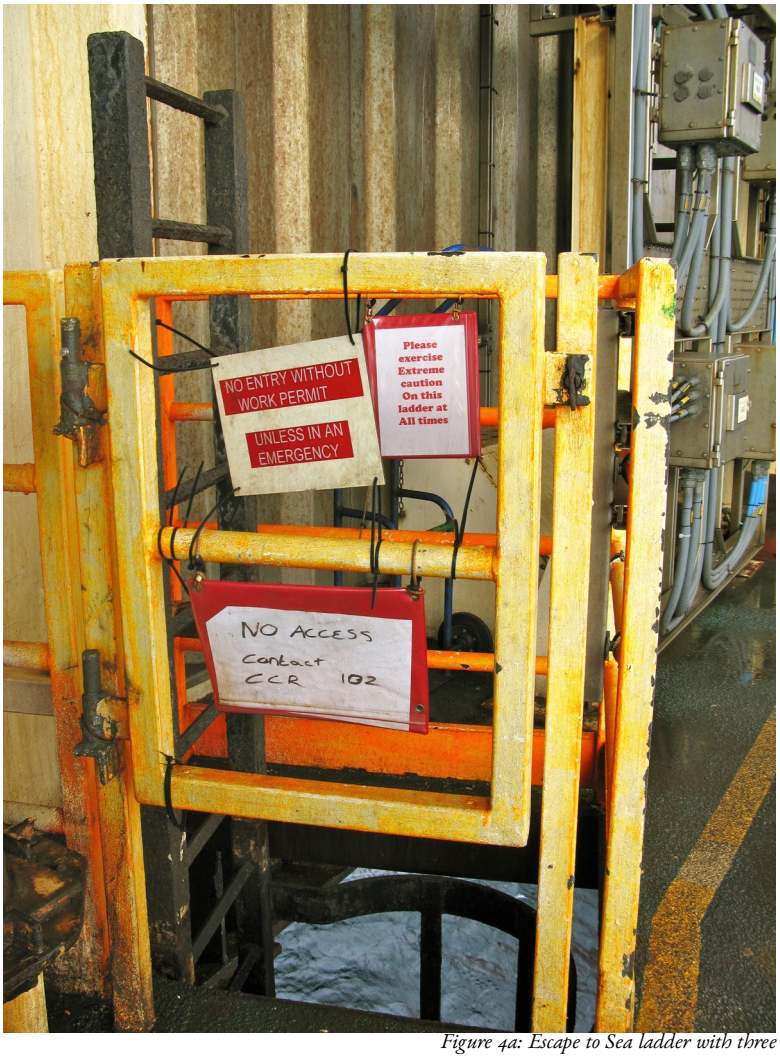

Figure 4a: Escape to Sea ladder with three warning notices

Jobs did not necessarily flow smoothly or continuously, and worksites often had the appearance of being incomplete or abandoned. This could be due to work in one area temporarily being stopped on account of other, more pressing, work being done in an overlapping work area. It could also be the case that in-demand tradesmen may have left one area to attend to other tasks, or to have a break in one of the tea-shacks (smoking or non-smoking) located at the flotel side of the gangway. Possibly a job may have been started, stopped, and temporarily abandoned in the programme of FLE (Field Life Extension) works, or alternatively, workers on night shift may have left a task incomplete to be resumed on their next shift.

Because multiple tokens could be used to indicate that, ostensibly, there was intent for work to resume, passing workers may have had to interpret the relevance and meaning of particular collections of artefacts. Thus tools, as well as extending the senses in use, also did so when out of use. Tools left lying on the deck, or pieces of kit in states of assembly or disassembly provided clues, although the patina of rust that quickly formed on non-painted

metal surfaces made it difficult to ascertain the exact relevancy or recency of this type of artefact. Sometimes more personal markers were left to indicate work in progress, such as coils of climbing rope left in obvious view by absent abseilers showing that 'rope access work' was taking place (Figure 4b). Sometimes markers of work, whether abandoned or completed, remained because they were functionally useful, for example pieces of tarpaulin used to contain shotblast grit on a previous job remained to act as convenient wind protection for those who were working in the area.

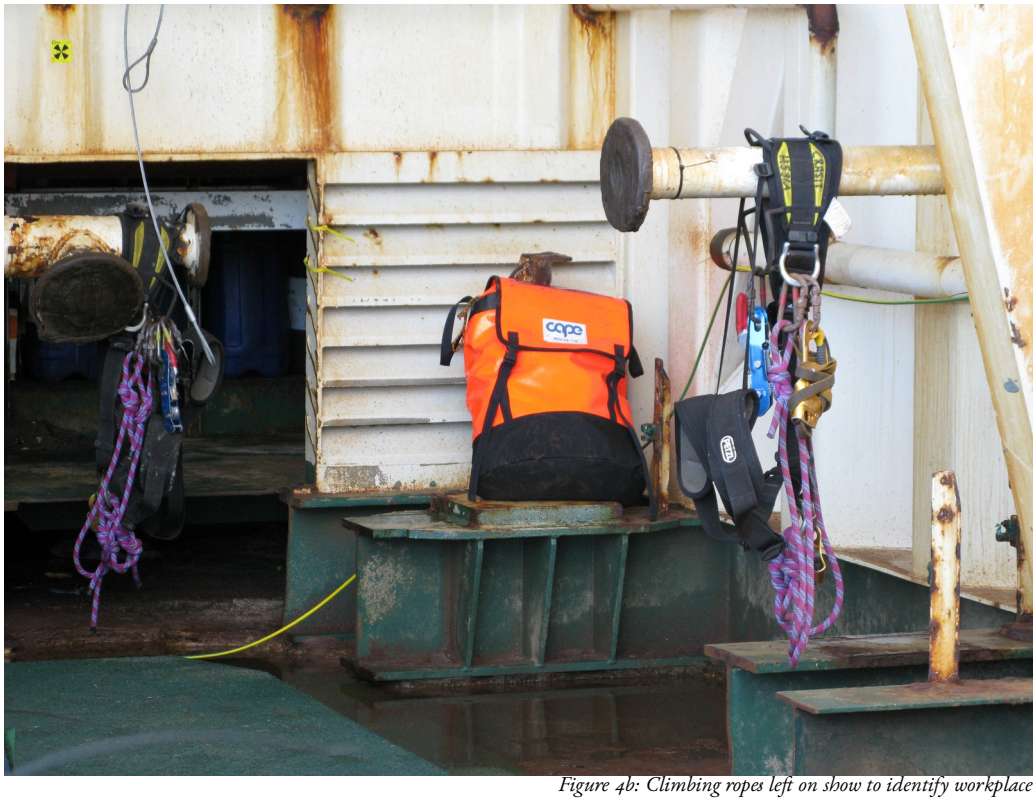

Figure 4b: Climbing ropes left on show to identify workplace

The meaning of colours and markings in such designated temporary work areas was often open to interpretation. Chevron and diagonal markings were used extensively to advise of hazards, and ranged from permanent yellow and black painted lines that warned of obstacles, to red-white diagonal adhesive tape which acted as a general notice warning of, for example, the bump hazard associated with scaffold at head height. While this tape was used as an adaptive warning notice by scaffolders, scaffold structures were regularly dismantled and erected elsewhere, meaning that this red-white adhesive tape could be seen on scaffold tubes that no longer presented obvious bump hazards. Thus, artefacts and how they are placed and configured on the platform had to not only be seen and read in context and with relation working bodies to be safe, but inferences also had to be made through drawing on specific platform knowledge and more longitudinal experience when such working bodies were absent. Beyond the confines of fixed platform structure, local workplaces were often de-

marcated by the use of habitats, which were temporary constructions built using scaffold and nylon or fabric sheeting. Such enclosed working areas were supposed to contain risk and are discussed in the next section.

Safety by demarcation of habitats and areas

As discussed in the last two sections was achieved both through formal structures and rules and informally, through temporary structures and arrangements, shaped by specific, anticipated safety concerns and responses. For example, to prevent gas ingress and so limit explosion risk, accommodation and other modules on the platform were pressurised. Access and egress, and therefore delineation of these areas, was via heavy sliding doors which, in common with many industrial doors, had many signs attached that further marked out the area. As well as a manufacturers' welded name plate, one door had a number of fixed plastic laminated signs; green stating 'muster area' and 'Slide to Open' (as in Figure 2a) , red stating 'ensure door is closed properly', and blue/white stating 'Fire door Do not obstruct' (as in Figure 2a). Additionally, an A4 size sign had been improvised, fixed with adhesive tape, typed in red font 'please close door with care and do not let it slam'. Such colours and signs and how they were associated with one another required seeing and reading by working bodies in place for them to be effective. They also, from the perspective of the creators, constituted a deliberate and skilful act of delineating space and making visible its function with relation to safety procedures.

Fixed platform structures constituted permanently segregated zones, designated as having specific safety requirements. For example, the main control room where technicians worked without the need for overalls or other protective clothing, and the electrical switchrooms that were fitted with heavy sliding metal doors were marked with signs identifying 'electrical hazard' and 'keep out'. These spaces were categorised not only by their function, but also in terms of their relation to safety. This categorisation had an impact on which working bodies could access them and the norms within them (e.g. concerning clothing). These zones were quite distinct from habitats, which were basically a form of tent, predominantly made with scaffold and nylon/fabric sheeting.

Habitats kept out inclement weather and kept in work hazards. Formally, there were three classifications of habitats, ranging from fairly basic nylon sheeting used to provide protection from weather for painting operations or from messy shotblast, through to pressurized 'safe houses' (constructions that were sealed with forced air ventilation) that were used to ensure there is no explosive risk during the 'hot work' of welding. Given platforms are generally open to air (they have no outside walls to allow for gas dispersal if there is a leak), the more general form of habitat tended to be left in place after it had served its intended purpose. Intact or in parts, habitats offered bodies protection from wind whistling through platforms and, at times, rain and snow, and sections could be commandeered as makeshift stores (squirrel stores). There was a large amount of scaffold on the platform and it was sometimes hard to tell whether a habitat was built using its own scaffold, or whether it was part of a bigger scaffold structure. There were a lot of redundant scaffold structures, in part

because it was easier to store scaffold as a structure rather than to carry and pile it on a platform with limited space.

Demarcation of work habitats was achieved by using barriers such as a scaffold gate, or lengths of plastic chain, plastic 'chevron' tape that had notices advising of 'no entry'. Working habitats would have a barrier: barriers were intended as independent control measures for marking-off territories of work. For example, a work activity on/near a walkway would have a section of the walkway barriered-off usually with plastic chain or cordon tape. When work was active, a 'Permit to Work' could be seen dangling in a plastic wallet somewhere on the barrier and a 'Watchman' would be on the perimeter of the working habitat. Although barriers were meant to keep people out, access was often granted by the Watchman giving approval (a nod, a thumbs up, or an 'OK' rather than via conversation) to other workers hoping to transit. No visible Watchman was assumed as access being permitted, although those approaching an unmanned barrier would often shout 'hello' or 'anyone there' before crossing the tape/chain.

Barriers were often temporary and transient, and because of this, workers had to interpret if they were relevant or meaningful (see above). Access was also often locally negotiated, for example, barriers were erected in such a way that they allowed others to walk past the workplace without having to significantly detour or by following the example of others. This workaround again acknowledged the presence and movement of working bodies with particular work rhythms on the platform. Some barriers were redundant, having been part of a habitat that was no longer in use. Workers appeared to know redundant barriers and would happily walk through these. Redundant barriers probably remained because there was no work command to remove them or perhaps because they were forgotten about in the busyness of the platform upgrade.

Beyond these habitats there were metre-wide walkways bounded by solid painted yellow lines around each level of the platform that, despite being faded and worn, showed transit routes. White painted arrows in the middle of these walkways pointed towards the lifeboats on the West side of the platform. Unless walkways were included in a work habitat, they were kept clear to allow free and safe access. These areas were specifically designed for moving, seeing bodies to transit through and, in the case of an emergency, reach safety. They were in contrast with areas immediately beyond the painted boundary lines, which were used as places to formally or informally store material.

Space was generally at a premium on platforms, and available deck space was quickly utilised. Formally, there were a number of demarcated 'laydown areas', where equipment and supplies were stored on the platform (e.g. Figure 5b). The increased equipment needed to support ad hoc construction activities meant that a number of unofficial laydown areas had become accepted, for example, to store heaps of scaffold clips, empty oil drums, or pallets of slings and shackles. Sometimes, these areas were marked out and made 'legitimate' by use of a suitable barrier, such as a cord with red-white tape.

Figure 5a: Laydown areas used to store equipment

Less formal, and more numerous, storage areas were 'squirrel stores' (Figure 5 (b)). These tended not to have barriers, but rather were identified as an accumulation of task-related material: nylon woven bags containing nuts, washers and bolts, or pipe flanges for example. The informality of this type of storage area meant it was difficult to assess if kit was intended for use, or if it had been discarded. Visual clues concerning the status of the area could be taken from windblown shotblast grit, earplugs and other debris, the accumulation of which helped determine how long 'material' had been left in-situ. This in turn gave an indication of whether this material was in use, or been abandoned.

This analysis shows colour was not exclusively used to convey safety messages. Many items of platform equipment might have a grey and rust hue but many were also painted to demarcate space, indicating a specific use, status, identity and relation to ongoing work. For example, the pedestal crane was painted yellow, process cabins were painted red and blue, pipework had bands painted in red, blue and violet to indicate process fluid, and smaller plant items such as instruments were multi-coloured. Additionally, the iso-freight containers used by vendors for equipment transportation and storage were painted red, green, yellow, or in a combination of colours to show contract company livery.

Figure 5b: Free space acts as an informal squirrel store

DISCUSSION

Other ethnographic studies, such as those of Goodwin on 'professional vision' (Goodwin 1994, 2000, 2017) or studies of radiologists scanning mammograms for signs of breast cancer (Hartswood et al., 2002) document the various ways in which those who routinely work with forms of visual evidence routinely learn to see or not see a particular phenomenon within particular evidence – such as evidence of breast cancer within mammograms or evidence of a past human imprint in soil. Any associated decision-making involves combining 'what they see', with an informed organisational understanding of what makes particular features noteworthy; "'seeing' involves an orientation to organisational relations and realities. Determinations of what a phenomenon 'really is' are reflexively tied to the practical purpose of working out what to do next" (Neyland and Coopmans, 2014, p.5). As Neyland and

Coopmans also note, when used by Garfinkel, the notion of 'accountable action' means both observable and reportable: 'situated practices of looking-and-telling' (Garfinkel, 1967: 1). Furthermore, such 'accountability relationships' (Munro, 1996, p.2, cited in Neyland and Coopmans, 2014, p.2) are manifested in and through the use of visual evidence; and are thereby part of a set of relations intimately linked to organisational courses of action. As Lynch puts it, 'Even something as basic as visual perception ('seeing'), for ethnomethodologists, is an irreducible social phenomenon that is distinctively organized in contexts of routine practice and social interaction (Coulter and Parsons 1991; Sharrock and Coulter 1998)' (Lynch 2013: 91). In the case of the O&G platforms, the visual evidence of coloured tapes, particular storage of objects, etc., enables or facilitates attempts to project the basis and reasoning for organisational actions back to the past, onto the present and into the future. However, whilst carefully mapping out the process whereby an O&G platform worker 'sees' danger (and safety) there is a risk that we present a far too elaborate account. While a novice platform worker might be obliged to go through an elaborate routine, the experienced worker just sees danger. As Lynch (2016) shows in his study of 'Seeing Fish' while the novice sees a ripple on the water and struggles to interpret it, the experienced fisherman sees fish, even sometimes what kind of fish and this seeing is just a part of a complex web of interrelated activity. We also acknowledge the danger of readings of directional signs such that they are shown to have "real, deeper meaning" behind (Sharrock and Anderson, 1973:82) when they are, in fact, just used one at a time to find the way.

Yet the focus on practical action in this research challenges the assumption, both in literature and by many working in the field, that by being compliant with organisational safety rules and procedures, workers on O&G platforms will be directed towards safe working practice e.g. through receiving safety communications, planning and performing work appropriately. During production operations, abstract process reliability and the flexibility to deal with day-to-day operations, gives a predictable working framework for the permanent production crew. We illustrate how a significant Field Life Extension (FLE) project disrupts the orderliness and containment of a production platform, transforming it into the messiness of a construction site, with activities spilling over into all areas of the platform. To the construction worker, this apparent chaotic environment has its own form of order – an order that may not be immediately obvious to the normal production crew, but nevertheless has its own form of process reliability and flexibility. The themes above at once show that because the oil platform is a sensorially rich environment, being a worker there means, on one hand, being able to sense and read this environment and, on the other, being able to participate in its ongoing construction (e.g. through erecting scaffolding in a particular way), augmentation (e.g. through the use of signs) and maintenance (e.g. through keeping collections of tools and equipment in place).

The fluidity and interaction of the North Sea construction environment demands that while workers safely engage with their own work sites, they must also recognise that their own activities are embedded in a larger dynamically changing workplace with changing rhythms and patterns of work with 'patterned energy-flow of action, marked in the body by varied stress and directional change; also marked by changes in the level of intensity, speed

and duration' (Goodridge, 1999:43, cited in Hockey and Allen-Collinson (2009:223). To stay safe, workers have to read the risks associated with their own workplace and, at the same time, be cognisant of the hazards that surround them while drawing on platform-specific knowledge and broader occupational experience. The ubiquity of energy consuming and heat generating equipment, the hands-on use of tools, and large-scale mechanical handling, means those at the sharp-end of work are constantly at the proximal side of danger.

When thinking abstractly about safety, and remote from the worksite, it is easy to think that safety messages are best communicated via speech. In reality, the conditions of the offshore worksite, with loud ambient background noise, means that verbal communication is limited. The continuous background din of diesel generators and air compressors demands that talk is often short, shouted statements augmented by exaggerated hand gestures, that in themselves, demand a degree of coding and interpretation. Thus, using the working body, not only to avoid danger but also to be placed in space and with relation to others in a particular way and to communicate directly and indirectly (e.g. through being visibly present in a particular place with others) is key to being safe on the oil platform.

On the job, seeing safety is of real importance to those engaged in hazardous activities, and, along with the body itself and its sense-making capabilities, is the primary mechanism for safety sense giving. Fixed equipment, signs, and warning notices are undoubtedly important, but these are abundant and seem somehow to act as a background to what goes on at the worksite. Colour too is used to draw attention to safety, and platforms use this extensively to identify hazards. There is a deliberate effort to construct safety through the environment as well. Thus, how workers make use and make sense of locally produced safety information can be explicated in terms of Goodwin's (1994) notion of professional vision and further understood as professional perception.

Through drawing on his own practice, the training of young archaeologists in a field school, and a 1992 case of white police officers accused of beating of an African-American motorist, Rodney King, Goodwin argues for the importance of "historically constituted discursive practices", "talk, ethnography, category systems articulated by expert witnesses" and "various ways of highlighting images provided by the videotape" to structure visual evidence to suit particular agendas and literally "see a meaningful event" (ibid, 606). He identifies three distinct, non-sequential strategies within this 'professional vision'. Firstly, coding schemes such as linguists' expert use of phonetic categories and archaeologists' learned use of a colour chart to describe dirt "transform the world into the categories and events that are relevant to the work of the professional" (ibid, 608). Secondly, knowledge-driven highlighting, or "methods used to divide a domain of scrutiny into a figure and ground" results in the identification of an "event relevant to the activity of the moment" (ibid, 610). Examples include highlighting and annotation of documents in various professions and archaeologists' attention to and outlining of certain features such as molds in significantly located earth. Finally, professional talk is complemented through embodied "external representations" that skilfully draw on "distinctive characteristics of the material world to organize phenomena" (ibid:611). As examples Goodwin presents archaeologists' collaborative use of a map in situ along with expert talk, gestures and situated measurements to visually chart excavations and

a defence attorney's use of carefully edited, printed and arranged still photographs of individual video tape frames in a courtroom to augment and amplify spoken argument.

Workers' shared understanding is not only the result of 'socially organised ways of seeing and understanding events that are answerable to the distinctive interests of a particular social group' (Goodwin 1994, p.606) but also broader bodily engagement. For Goodwin, this means the production of "particular, action-relevant postures" (2017:204) that are public and visible. For the North Sea construction workers, as competent practitioners in the field, the handwritten sign and the strategically placed piece of personal equipment constitute structures of intentionality which contain, in succinct dialogue-free form, salient information relating to the work being performed by present or absent bodies. These tokens of safety form part of the embedded bodily work practice of the platform, and become 'categories of relevance for the profession...and are used....to structure interpretation of the landscape' (Goodwin, op cit. p.610). On one hand, these become part of 'how those who routinely work with visual evidence learn and in practice manage to 'see' the phenomenon they are asked to assess "for what it really is"' (Neyland and Coopmans, 2013, p.4): specialist signs that can only be read by oil platform workers as part of the everyday if skilful routine of 'being safe' through noticing. On the other hand, these signs, and in the terms of Latour (1987), constrain workers' bodily movement and represent 'credible, reliable and knowledge' (Neyland and Coopmans, 2013, p.5), inscribing knowledge of safety into the O&G production environment. It is this, rather than rules and procedures that enable a shared understanding among the scaffolders, pipefitters, painters and other trades who share a common understanding of the offshore environment.

Understanding professional vision as "socially organized ways of seeing and understanding events that are answerable to the distinctive interests of a particular social group" (Goodwin, 1994:606), signs and spaces on the offshore platform become "objects of knowledge" about danger through being identified as being areas of note ("domains of scrutiny"). Particular collective practices ("specific activities") are performed around these signs and spaces in order to recognise danger and achieve safety in their jobs. In contrast to Goodwin's (ibid) use of Foucault's work on discursive practices to understand how expertise and its conditions are established in a profession, we suggest that Foucault's work on the clinic and medical expertise and practice provides better insights into the construction of safety. As with the medical clinic (Foucault, 1973), the platform creates a particular relationship between sight and truth and evidence, as well as the normative practices of work.

Foucault (1973) places "the clinical gaze" at the core of modern medical practice and knowledge construction. He also associated such practice and construction with both a specialist setting, in his case the hospital, and particular vocational training: 'The clinic was probably the first attempt to order a science on the exercise and decisions of the gaze' (ibid:89). Goodwin's 'professional vision' (1994) also places trained, professionally informed sight at the centre of modern expertise and documents the various ways in which those who routinely work with forms of visual evidence learn to see, or not see, a particular phenomenon within particular evidence – such as evidence of a past human imprint in soil (Goodwin, 1994). This emphasis on the importance of structured, directed and trained sight

and its close relation to "local actions" in production of action is continued in Goodwin's later work (Goodwin, 2017), as well as ethnographic studies of radiologists use of visual evidence through the scanning of mammograms for signs of breast cancer (Hartswood et al., 2002) and the reviewing and 'grading' of retinal images for diabetes related complications (Coopmans and Button, 2014).

Prima facie, the strategies of professional vision would seem to apply to the construction and practice of safety on an O&G offshore platform. However, this setting poses a series of challenges. Firstly, the noisy platform environment means that Goodwin's "discursive practices" can't easily rely on conversation. The environment also means that platform workers are forced to construct and perform safety expertise in the absence of conversation. A focus on vision alone in this setting, as a physiological phenomenon carried out by individual bodies, almost certainly underplays the role of other senses (Goodwin, 1994). Goodwin (1994) consistently refers to the role of perception more broadly, especially the situated use of hands and placement of the body to "sustain a participation framework" (Goodwin, 2017: 191). While this emphasis on the orientation of the body, its role in shaping action and participation and its use as a means of making sense of otherwise opaque practice is present in Goodwin's later work (2017), what is spoken is also consistently used to make sense of what is observed, even in the examination of the predominantly bodily game of hopscotch (Goodwin, 2000). In addition, in that work the body is considered primarily semiotically and with relation to the ongoing sequence of action and interaction, less as a means of knowing as we have argued here.

This critique results in us making two observations. Firstly, the signs, habitats and areas observed are expressions of a conscious, material effort by oil platform workers to collectively construct a regulated environment in which certain actions are deemed normative and others are not. It is difficult to understand these as only "being constituted as an environmental lamination" (Goodwin, 2017:204) that supports organization and classification, as with the archaeologist's Munsell colour chart that is used to classify soil samples. While read by a community of "competent members…who can work with…objects to see the world properly" (ibid:205), these visual cues are created ad hoc, as needed, and, in most cases, they are the environment. If this effort were primarily implementing procedures and following rules handed down from management and shaped by regulating agencies, it would be doubtful these signs could have 'become ingrained with the material arrangements and practices in and through which relations of holding and being held to account unfold, are sustained or are altered' (Neyland and Coopmans, 2013, p.2). Thus, working safety is not a reflection of static organisational rules that reside somewhere remote to the work being carried out (Suchman, 1983), but rather it is best seen as reflexive social practices – understood by, and through, how workers indexically account for their own and others actions. Worker generated, safety significant tokens are colourful and abundant. It is these that produce the local order of safety; marking out areas and boundaries of work, as well as offering information about the status of work and, as such, can be regarded as almost an overlay to platform fixed information.

Secondly, while we draw on the work of Goodwin's (1994, 2000, 2017) and Neyland and Coopmans (ibid), our analysis shows that they underplay the role of the moving, placed body in professional vision and accountability through primarily focusing on sight. Goodwin (2000, 2017) carefully analyses the role of the body in providing a publicly available, intersubjective grounding for action and emphasises the importance of gesture for kinaesthetic knowing, as being "crucial to the way in which the body knows the world through the hand" (Goodwin, 2017:211). However, the body's ongoing role as a sensing mechanism (e.g. through proprioception), crucial to the achievement of ongoing work, is not as evident as in this context. In much ethnographic work the sense of sight has been prioritized through what Hockey and Allen-Collinson (2009, p.225) suggest is 'Kantian hierarchical ranking' that promoted touch, sight and hearing due to their purported '"objectivity"' (ibid). Foucault (1976, p.109) traces this dependence on and prioritizing of the visual to clinical observation where: 'The observing gaze manifests its virtues only in a double silence: the relative silence of theories, imaginings, and whatever serves as an obstacle to the sensible immediate; and the absolute silence of all language that is anterior to that of the visible.' While we have shown that, in contrast to the clinic, in vivo it is the sensing body that is central to observation and safety construction in the environment of the oil platform, we cannot disagree with the sentiment that it is 'seeing' alone that is often assumed to give other senses meaning and, by implication, is considered the key to knowing. What we have argued for here is that while seeing may be central to knowing, it is the holistic, sensing, working body that is crucial in the process of transforming seeing into knowing.

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