



NOPSEMA

Australia's offshore
energy regulator

IRF Prevention of Well Control Incidents Opportunity Statement

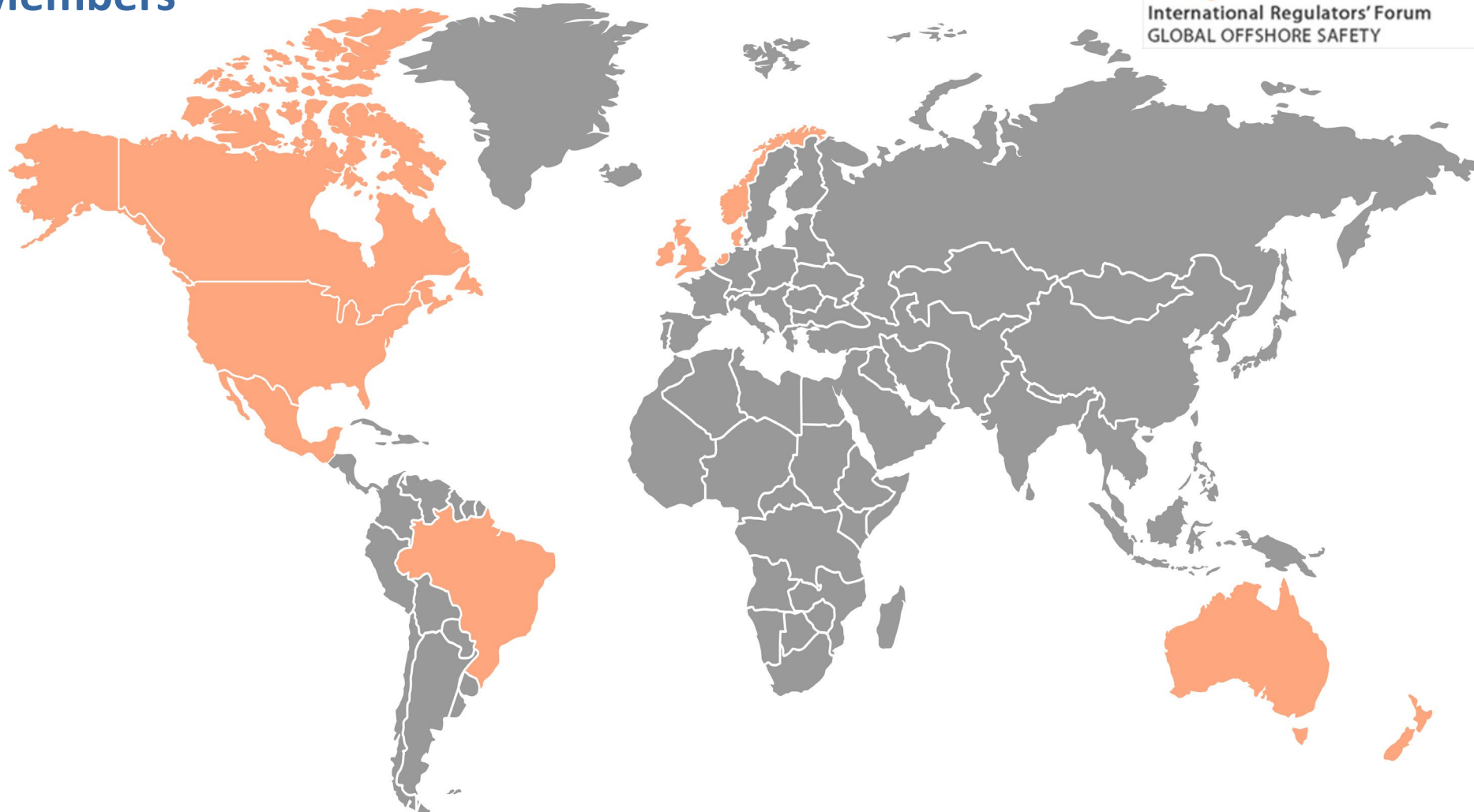
IWCF Australasian branch meeting
27 July 2023

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nopsema.gov.au



IRF Members



Canada Energy Regulator

Régie de l'énergie du Canada



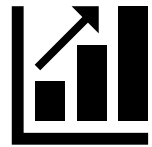
CNSOPB



CANADA-NOVA SCOTIA OFFSHORE PETROLEUM BOARD



IRF Opportunity Statements



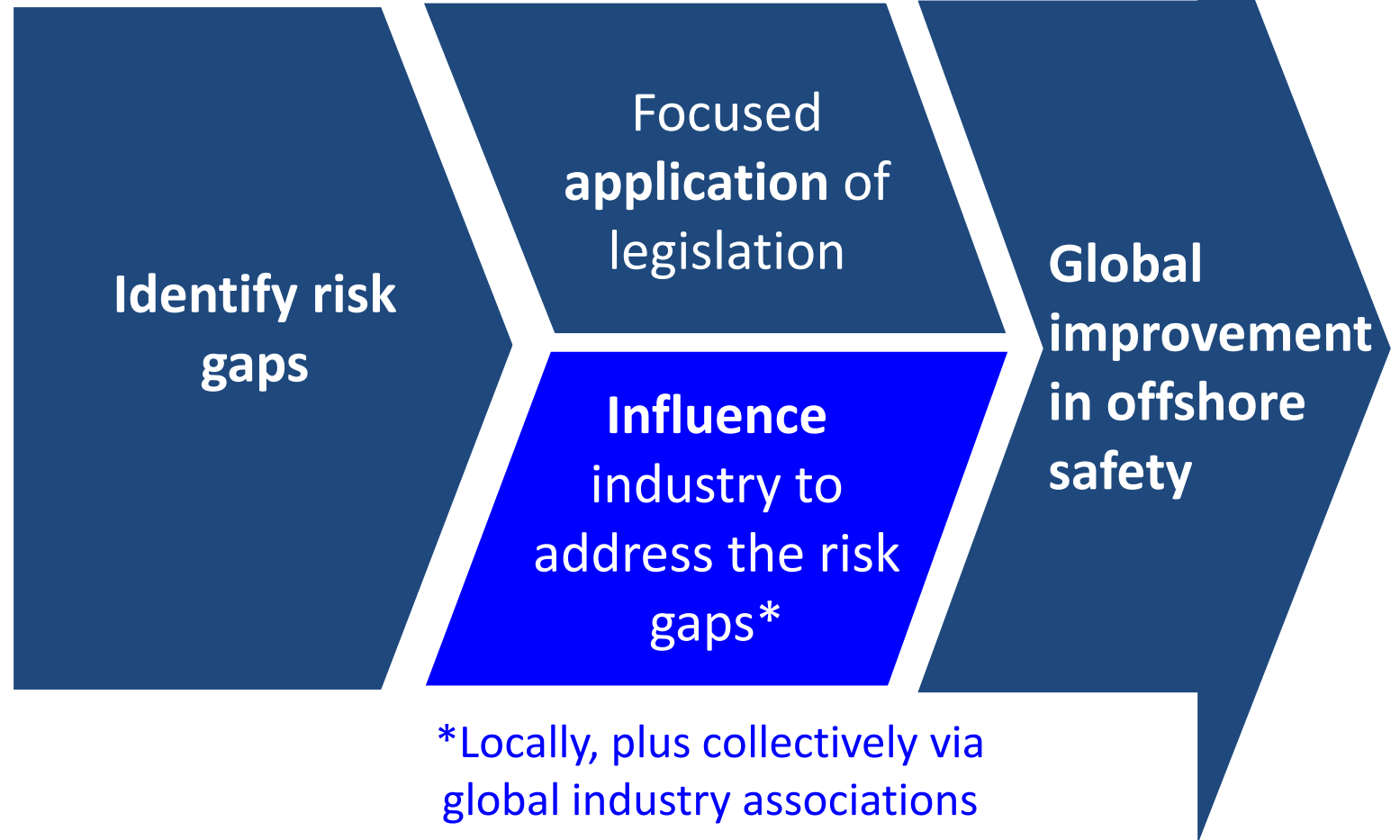
Risk gap



Common issue



High consequences

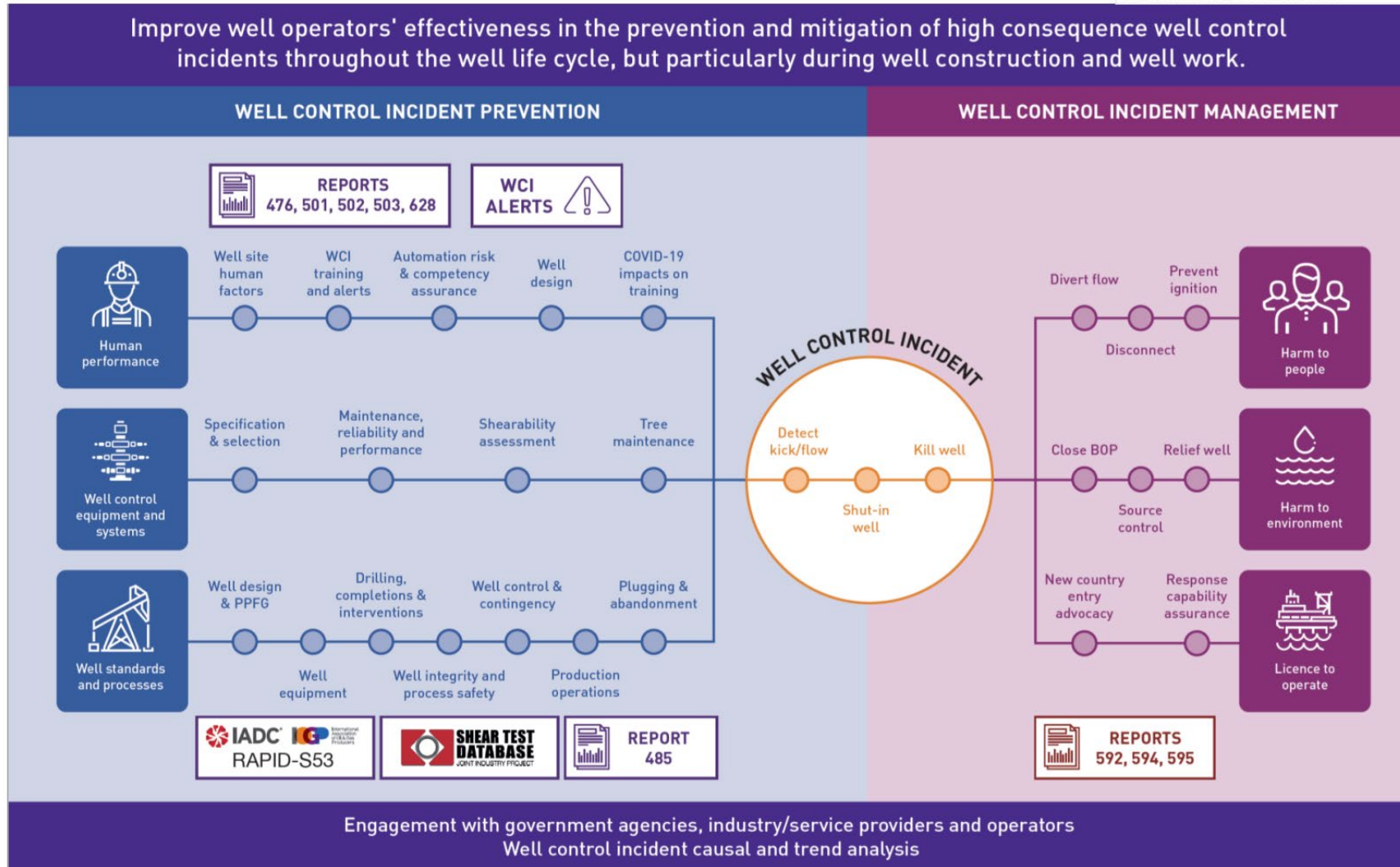


*Locally, plus collectively via global industry associations

No-one wants this



IOGP Wells Expert Committee Framework



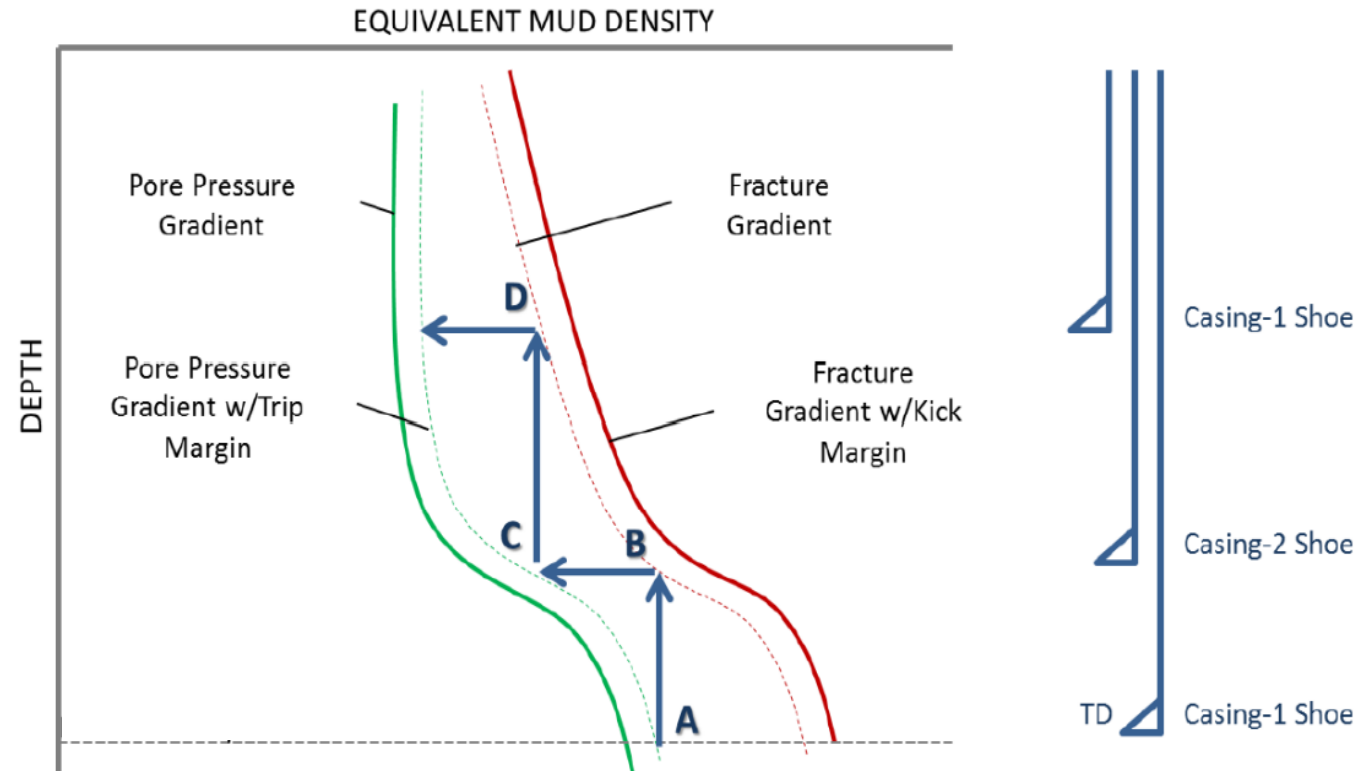
PPFG analysis

Pore pressure (PP) analysis

- The study of how pressure in rock pores vary with depth

Fracture gradient (FG) analysis

- Prediction of the pressures required to fracture the formation



Wild Well Control response statistics

As presented at IWCF 2022 AGM

Well Control Services	2016	2017	2018	2019	2020	2021
Surface Blowout with Fire	3	2	2	4	0	2
Surface Blowout	17	36	36	31	23	23
Pressure Control	25	32	36	25	19	26
Unconventional Intervention	48	59	74	106	71	84
TOTAL	93	129	148	166	113	135

Societal expectations have increased

PPFG analysis & real time PP monitoring must keep ahead of these expectations

A tool to help teams involved in generating and using PPFG predictions:

- Ensure a rigorous approach
- Improve understanding and communication

Widespread application will lead to fewer well control events globally



Evolution of the Well Control Opportunity Statement

2017  IRF / NOPSEMA identified a gap in international guidance on PPFG prediction¹

2018  Incident data gathering

2019  IRF drafted opportunity statement with IOGP

2020-21  IOGP PPFG taskforce formed to develop industry guidance

2022  IOGP PPFG guidance published

Summary of opportunity:
↓ well control incidents
through ↑ emphasis on
PPFG prediction and its
application

¹ <https://nvq12c.p3cdn1.secureserver.net/wp-content/uploads/2018/10/2017JUNE-NOPSE2017june-MA-.pdf>
<https://www.nopsema.gov.au/sites/default/files/documents/2021-04/A559567.pdf>

Why was the guidance written? (2)

2017  IRF / NOPSEMA identified a gap in international guidance on PPFG prediction

2018  Incident data gathering

2019  IRF drafted problem statement with input from IOGP

2020-21  IOGP PPFG taskforce formed to develop PPFG industry guidance

2022  IOGP PPFG guidance published

Numerous global events with similar root causes:

1. Overconfidence in pre-drill prognosis
2. Actual PP >> pre-drill prediction
3. Early signs of underbalance missed or inadequately actioned

IOGP Well Control Incidents - Causes

Poor communication between subsurface and drilling on log trends

Poor kick detection

Influx misdiagnosed as ballooning

Influx masked by mud treatment

Failed to detect influxes at connections

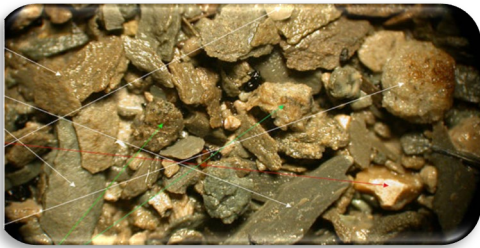
Gas readings misinterpreted. Driller not empowered to shut the well in.

Gas sampling system malfunctioned

Low vigilance. Mudlogger & geologist didn't interpret gas & log trends correctly. Wrong MGS lineup.

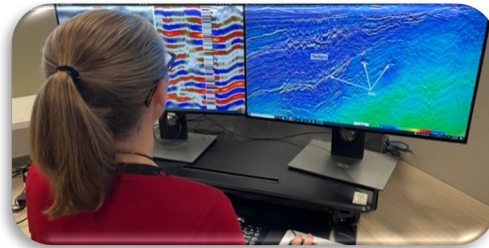
Outcomes included: Complex well control operations, failure to meet well objectives, gas in riser

Contents of the PPFG guidance



Definitions

- Stress
- Pore pressure
- Fracture pressure
- Drilling



Pre-drill PPFG prediction

- Methods
- Components
- Uncertainty
- Pre-drill assurance



Real-time PP monitoring

- Planning
- Recommended practices during drilling
- Post-well review

Implementation of the PFFG guidance

Australia:

- Companies are using the new guidance to cross-check their PFFG work
- NOPSEMA uses the PFFG guidance as a benchmark, and conducts operational inspections to monitor compliance

Globally:

- IOGP is preparing an information sheet tailoring the PFFG guidance for drilling personnel
- IOGP and IADC have an action to influence Wellsharp and IWCF training programs re PFFG
- IOGP updated Report 476 on well control competency to ↑ awareness of PFFG risks
- IRF surveys to monitor implementation



IOGP safety trends

- 2022 IOGP safety data showed a significant increase in global fatalities in both 2021 and 2022 (mainly contractor personnel).
- Lost-time-injuries (LTIs) also showed a considerable increase in 2022.
- IRF views the IOGP data as a “*warning sign that industry risks had climbed since 2020 ...*”¹
- Possible causes of the trend, according to the IOGP position statement², include:
 - Lack of onsite management since emergence of COVID-19
 - Increased admin workload
 - Continued complexity for contractors due to clients’ misaligned standards and requirements
 - Less experienced workforce

Sources:

¹ IRF-Communique-2023.docx (live.com))

² IOGP identifies potential causal factors in personal safety incidents - IOGP

Figure 4

