

Evolution of virtual exercising and response at Shell

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As a global energy company, Shell operates multiple facilities that present process safety risks in its operations. Being prepared for any unplanned event during day-to-day activities forms an integral part of Shell's DNA. The company has invested significant efforts to develop a robust training and exercise programme to continuously improve its emergency response capabilities at the local, national and global level. When the COVID-19 pandemic happened in early 2020, one of the significant impacts on Shell's exercise programme was the travel constraints that interrupted the practice to render global assistance to support the asset at site.

Historically, emergency response exercises involving regional or global support were always practiced using a face-to-face model. Challenged with the uncertainty of when will international borders re-open and learning from travel complications arising from industry incidents occurring during the pandemic, Shell's Global Emergency Management (GEM) Group started looking into alternative ways to exercise and respond. This resulted in two additional models being developed and introduced - the Virtual and Hybrid models. Table 1 describes the conceptualization stage for the three different models, their benefits and constraints.

Table 1. Concept of the three operating models.

Operating Model	In-Country	Virtual Support	Benefits	Constraints
Full Face-to-Face IMT	<ul style="list-style-type: none"> • In Field Response • Local Response • Incident Management Team (IMT) • Incident Command Post (ICP) 	None	<ul style="list-style-type: none"> • Face-to-face interface with local authorities – positive representation • Easier to foster collaborative environment (rainbow effect) • Greater situational awareness and connects with field teams • Quicker to react to changing circumstances 	<ul style="list-style-type: none"> • Quarantine and travel restrictions • Team resilience: One illness/case can spread to other team members • Managing precautions to limit spread of illness/viruses (more space required, hot/cold zones) • Extended rotation times for team members
Hybrid: Small Local IMT with virtual IMT support	<ul style="list-style-type: none"> • In field Response • Local Response • IMT 	<ul style="list-style-type: none"> • Hybrid ICP • Virtual responders interact directly with appropriate sections in local 	<ul style="list-style-type: none"> • Face-to-face interface with local authorities – positive representation • In-country hurdles may be easier to be 	<ul style="list-style-type: none"> • Team resilience: One illness/case can spread to other team members • National infrastructure (e.g. internet access and

		(physical) IMT	resolved by local IMT presence	speed) for expert support to the IMT • “Virtual Fatigue”
Fully Virtual IMT	• In field Response	• Virtual ICP • Virtual IMT	• No quarantine / travel restrictions • Minimal interaction between responders, except tactical teams in the field • No risk of spreading illness/viruses by reducing face-to- face interactions to field teams only	• Lack of in-country / physical IMT presence may be perceived as “reduced” response efforts, and “disconnection” from the incident • “Virtual Fatigue”

Following conceptualization, implementation of the two new models required additional efforts in terms of training, and IT proficiency. Many of the tools required to operationalize the models were already available in Shell. The first step was to assess the feasibility of these tools to meet the requirements of the desired Hybrid and Virtual ICP settings. Collaborative work between the software developers and Shell enabled customisation and gained further functionality of the tools to better suit GEM’s needs.

The next stage was to test different combinations of tools to determine the most effective communication and information sharing platform for the Hybrid and Virtual ICPs. GEM progressively tested the new ICP set-up and developed working procedures, starting with small scale exercises and gradually expanding the scale. Over the last 21 months, Shell had completed more than 20 exercises of varying scales either in the virtual or hybrid format. Following each exercise, GEM refined the procedures to improve working practices for the virtual and hybrid environments. Figure 1 summarises the development journey of the new models.

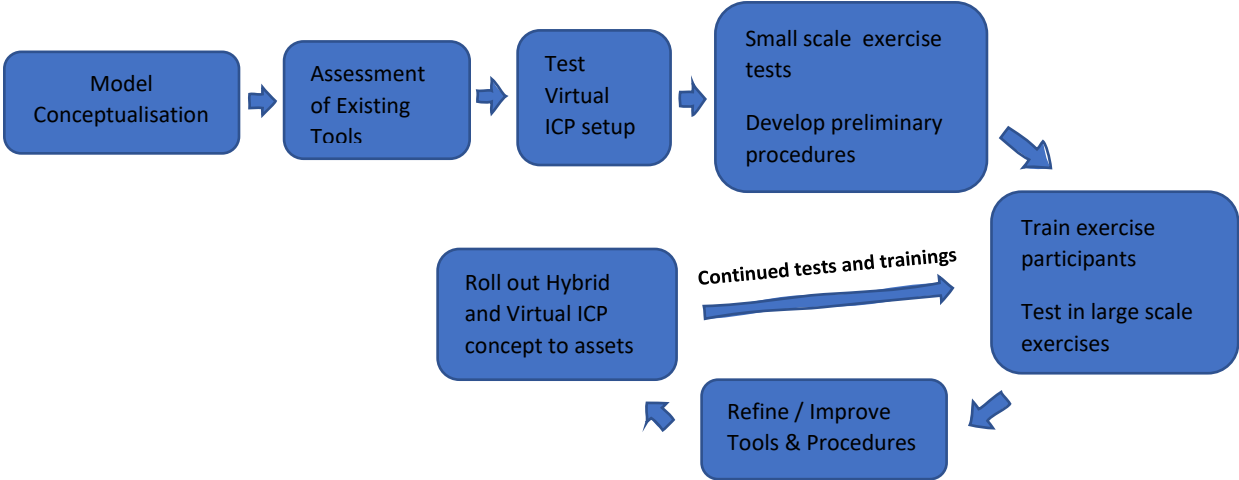


Figure 1. Development journey of the Virtual and Hybrid exercise and response models.

The largest exercises to-date utilising the new Virtual and Hybrid models were in regional exercises. The Virtual and Hybrid ICPs have been set-up to bring together more than 200 internal and external participants across 17 timezones to respond to incidents in Americas, Europe and Asia. These large-scale exercises test Shell’s capability to work closely together with regulators, industry partners, contractors, and response organisations to respond efficiently and effectively to an incident. Shell’s experience so far has demonstrated that the Hybrid model presents the most effective mode of response, enabling quick global support to the local IMT without compromising the local in-country presence as shown in Table 2.

Table 2. Effectiveness of the three models.

	Full IMT collaboration	Quick mobilisation	Quick IMT support	IT critical	Regulatory Connect	Interaction with Field Teams	Coaching and training	Interaction with Media / Community
Face to Face	Yes	Partial	Partial	No	Yes	Yes	Yes	Yes
Hybrid	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fully Virtual	Partial	Yes	Yes	Yes	Partial	Partial	Partial	Partial/ Ineffective

The investment made in the models’ development has already proved beneficial, as these have been applied on separate occasions to provide support to local IMTs responding to incidents. In those incidents, the Virtual ICP set-up significantly improved the speed of inclusion of the technical experts working remotely with the asset. It was observed that the prompt integration of these experts improved their situational awareness, which in turn allowed the experts to immediately collaborate with local IMT members to assess worst case environmental impacts and develop robust spill response strategies.

With the two new models tried and tested, Shell now has a wider range of response tools ready to cater for the ever-changing conditions. It is recognised that the Hybrid model is likely to be the closest to reality in managing real incidents and therefore GEM’s focus in 2022 is to continue to refine the way exercises and incidents are managed to ensure maximum effect and efficiency.

Author’s note: during our presentation, we would like to screen a short video we have created in reference to the topic of the abstract. The video can be viewed here -

<https://vimeo.com/669900989/0c6351ba00>