

JOIFF Africa Conference 2022



JOIFF chairperson Pine Pienaar and directors Alec Feldman and Gerry Johnson together with speakers and attendees at the JOIFF Africa Conference 2022

The JOIFF Africa Conference 2022 took place at the Emperors Palace Conference Centre in Johannesburg, South Africa on 14 and 15 November 2022. The event, which attracted both municipal as well as specialist industrial and petrochemical fire service chiefs, leaders and representatives, provided

attendees with technical insight, research projects and results as well as practical advice in dealing with any size scenarios as well as daily risks faced by these sectors.

Some members of the JOIFF Board of Directors also attended the event including Alec Feldman and Gerry Johnson. There were several exhibitors displaying their products and services in the networking hall including the platinum sponsor, the Advanced Group of companies, Bristol Fire Engineering, DoseTech Fire, Dräger, Dr Sthamer, Emergency Training Solutions (ETS), Fidelity Fire Solutions, Fire Raiders, Fomtech and Unqondo Projects, Marcé and Hytrans Fire Systems and Vanguard Fire and Safety.

JOIFF chairperson, Pine Pienaar, welcomed all and provided background information on JOIFF, the International Organisation for Industrial and Petrochemical Emergency Services Management and its membership benefits.



JOIFF chairperson, Pine Pienaar

Session one of the JOIFF Africa Conference 2022 focussed on

disaster management during large scale incidents and included a presentation on 'Understanding evacuation modelling and human behaviour' by Stellenbosch University's Dr Natalia Flores Quiroz, which factors that influence evacuation, human behaviour in fire and computational evacuation modelling. Dr Quiroz said that large scale evacuations due to fire events are becoming more and more common and present challenges such as not having enough exit routes and lack of information on when, where and how to evacuate. "Understanding human behaviour in fire is critical for improving fire safety. Computational modelling can be very useful to understand evacuation in complex buildings or complex situations", said Dr Quiroz. She also detailed the factors that influence fire evacuations and the various computational modelling techniques, which include movement, behaviour and environment.

Western Cape Disaster Management and Fire and Rescue Services Colin Deiner, spoke about 'Flooding in

Kwa-Zulu Natal - lessons to be learned'. Deiner provided statistics on the impact of Tropical Storm Issa that hit KwaZulu-Natal in April 2022. He detailed the Western Cape's search and rescue (SAR) capacity and its response, deployment and operational assistance, saying that it was positive to note that various agencies all came together with aerial support from the SANDF and South African Police Service (SAPS). Deiner also discussed the incident command, which was the responsibility of the SAPS, the SARZA joint operations command (JOC) and the coordination by the Kwa-Zulu Natal Provincial Disaster Management Centre (PDMC), with engineering assistance, the PDMC JOC/Provincial JOC, National Interministerial Committee on Disaster Management (ICDM), NJFCC/NDMC and cluster response. He shared key observations, saying that rapid response to early warning systems is essential, South African response teams need to refocus on regional risks, clear incident command must be established early, no political interference and safety is always the top priority. He also thanked the various agencies and volunteers that responded for their support including SARZA and National Sea Rescue Institute.

Ian Scher of Rescue South Africa discussed large scale disaster rescue, providing background on the formation and history of Rescue South Africa, saying that its primary objectives are to respond to sudden onset disasters and provide technical rescue skills, to build a cache of equipment to be used for both training purposes and response and to build capacity by offering rescue training, regionally, nationally and internationally. Scher said that they approached USAID for funding and eight American rescue technicians came to South Africa, qualifying 26 trainers. He also detailed its cache and how it is utilised and maintained with videos of a walk through the warehouse, describing the various equipment categories as well as its radio communications equipment. Scher discussed Rescue South Africa's training model, sharing



JOIFF director Gerry Johnson, JOIFF chairperson, Pine Pienaar with JOIFF director Alec Feldman

a video on recent training events and concluded with videos on their recent disaster response missions, announcing the addition of the new diving crew in Durban.

Session two focussed on foam technology and LASTFire's Dr Niall Ramsden provided an update on NFPA 11 with test results on new generation foam concentrates. He also discussed the fluorine free foam issue and shared updates from European Chemicals Agency (ECHA), the NFPA/EN, LASTFire research network and the Arctic Council. Dr Ramsden said that the ECHA Annex XV Restriction Report was good summary and a genuine attempt to be practical and understand the risk, adding that Risk = Probability x Consequences. He also detailed the PFAS-containing fire fighting foams management plan. Dr Ramsden discussed the NFPA 11 Standard for low, medium and high expansion foam, saying that greater clarification is needed especially for tank fires, losses due to wind and compressed air foam (CAF) systems. He shared recent LASTFire research, test protocols, results and videos. He also shared the test results of their crude oil testing in the five-metre diameter test tank with different application techniques, nozzles, foams and proportioning rates. Dr Ramsden shared information on the large scale polar solvent test fires and the phasing out of AFFF in the Arctic.

Williams Fire and Hazard Control's Dean Roux set the scene for fixed fire reticulation systems versus mobile response systems discussing the benefits, challenges and shared learnings of each application. Roux described the mobile response components, fixed system components, benefits, performance components and challenges such as what happened during the Buncefield incident in December 2005. He also shared various case histories and explained the challenges faced from mobile response. Describing their ongoing developments in strategic tactical fire planning and logistics, Roux described that monitor water strainers were inbuilt to the waterway and through-monitor-manifolds allowing multiple monitors connected for crude oil applications and post suppression. Roux added the use of aerial drone usage and incident command during multi-agency responses.

Tetra Tech's Dr Ian Ross, detailed the 'Transition from older generation foam concentrates to new generation foam concentrates - not merely a matter of take out and replace'. Dr Ross provided an overview and the characteristics of Per- and Polyfluoroalkyl substances (PFAS) as well as PFOS and PFOA and its precursors, looking at its toxicity levels in human exposure, blood and its environmental footprint. He shared global media reports



Conference presenters

incidents involving hazardous chemicals. He shared details regarding several hazmat incidents including the Hydrogen explosion on 8 January 2007 at the Muskingum River power plant, when a rupture disc failure caused the explosion. Dr Blumire discussed Hydrogen, saying that the flame has no colour and can't be seen during daytime but can be detected via ultrasonic sound detection. He also looked at the future of Hydrogen, its production, density and flammability and the issues arising when confined, adding that its ideal storage temperature is minus 253 degrees Celsius. He shared some case studies and its comparison with various other fuels such as natural gas and petrol.

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Session three focussed on managing emergency responders with Dr Rina Steynberg discussing 'Total wellness of emergency responders' and shared the role of resilience in total wellness, saying that resilience is the inner strength of body-mind that enables one to respond well to adversity. "It is the capacity to prevent stress related conditions ie anxiety, depression, illness, recover faster and more completely, optimise total functioning ie mental, emotional and physical or in other words, the ability to bounce back. She described the resilience model: the trigger, response, resources and result, detailing each and explained short versus long term stress. She concluded with constructive leadership and culture, detailing the basic needs of a team.

Mike Perry of Africa Reptile and Venom shared 'Identification, safe handling and treatment in event of snake bite incidents by emergency responders'. Perry shared the history of antivenom in South Africa, its manufacturing and extraction, freeze drying process, adding that horses are used as antibody factories and the

use of hyperimmune horse blood. He detailed the main African snakebite culprits, the common facts about snakes, saying that there are about 170 species and sub-species of snakes in southern Africa with around 10 percent of those considered dangerous to man. He listed the most dangerous snakes and the signs, symptoms and result of their bites.

Dr Nigel Blumire of CTIF shared information on the Hydrogen economy and its future challenges for responders. Dr Blumire provided the background on the National Chemical Emergency Centre (NCEC), which was established in 1973, set up by the UK Government to provide emergency response support to

Session four saw Stellenbosch University's Prof Dr Richard Walls discussing structural fire engineering for industrial buildings, sharing who is responsible for structural fire resistance looking at SANS 10400-A Form 4, SANS 10160-1 SANS 10400-T and SANS 10177-2, understanding structural design and load paths, how fire affects structures, satisfying fire resistance and sharing several case studies. Dr Walls also looked at the effects of fire on concrete and timber as well as composite deck design, saying, "All structures require the fire resistance to be checked. Structural engineers should do this to SANS 10160, although it is typically not done. Most structural engineers in South Africa currently have very



Conference presenters

little knowledge about fire design.” He added that fire resistance can be verified using relatively simple methods and that good design can save a lot of money in passive protection. He concluded in saying, “Real collapse comes from restrained thermal expansion rather than material getting weak. If your team gets killed it will be from a connection failing rather than anything else. There are many emerging construction systems that are not fully understood and their fire resistance must be carefully considered.”

FireDos’ Frank Preiss’ presentation focussed on the importance of accurate foam proportioning and how to achieve it. Preiss discussed laws and regulations, typical incidents, foam and foam concentrates, extinguishing systems and foam concentrate proportioning. He said, “When deciding what type of proportioning system should be used various aspects have to be considered such as what are the properties of the foam concentrate, what is the anticipated minimum and maximum water flow, how much do I initially want to invest, what will the cost of my annual testing of the proportioning rate be and what size of bladder tank or foam concentrate tank do I need to comply with NFPA 11 recommendations. Preiss continued in discussing on what is necessary to achieve and assure accurate foam proportioning, which is foam concentrate, proportioner, piping and discharge devices must be compatible with each other and that the proportioning system must be designed to allow correct proportioning over the complete water flow range and anticipated pressures specified in the fire fighting concept. He said, “The correct functioning of the proportioner, including the proportioning rate, must be tested at least once per year. When planning a fire extinguishing system do not only consider the initial investment cost but also the regular maintenance cost for example testing the proportioning rate with possible disposal of premix or foam; the least expensive system may not have the lowest total cost of operation.”



Platinum sponsor, the Advanced Group of companies’ team

André Tomlinson’s presentation focussed on ‘Refinery to terminal conversion: Toolbox adaptations for emergency management services, which is a business solution to extend the life of refineries that have become economically unviable or have become otherwise obsolete, inoperable or defunct as distillate producers. Tomlinson discussed the transition phases, categories of emergencies that can occur at POG risks, types of fires, risk profile evolution during transition and anticipated events during transitioning such as vapour cloud events, spills and pressure-releases, fires, hazmat releases, height and crush-related accidents and general trauma. “Basically, everything you can experience during a major shutdown,” said Tomlinson. He detailed the required response competencies and resources, saying that the keys to success are effective resources + proven methodology + plans and procedures + training/competencies = successful extinguishment. He also discussed the refinery to terminal (RTT) service delivery dilemmas as well as detailing some effective service delivery models.

Rural Metro’s Chris Gilbert discussed protecting essential infrastructure: the fire service challenge. He described South Africa’s freight rail, corridor operations, electricity infrastructure, strategic pipeline infrastructure network, which extends over 3 800km

as well as the eight commercial seaports along South Africa’s 2 954km coastline. Gilbert also looked at the impact of theft and vandalism on public infrastructure and shared several recent examples, highlighting the impact of these on the fire services. He said that the challenges faced by the fire services during these incidents included capacity, preparedness/planning, remote locations of incidents, jurisdictional, resources and training. “We need a multi sectoral forum to engage on special risks in South Africa, create awareness across all sectors and engineer capacity building strategies in order to build resilience”, said Gilbert.

The Conference was supported by the platinum sponsor, the Advanced Group of Companies and by several other sponsors who displayed their products and services in the networking hall.

JOIFF is a not-for-profit organisation dedicated to developing the knowledge, skills, understanding and competence of emergency services management, primarily in high hazard industry, by working to improve standards of safety and of the working environment in those sectors in which its members operate.

Fire and Rescue International magazine was the official media partner and photographer of the event.

[View the full photo gallery](#) ▶



