

Using Artificial Intelligence to Support Emergency Management Training

Creating Efficient and Realistic Scenarios with ChatGPT

Lasse Berntzen

Jarle Løwe Sørensen

Marius Rohde Johannessen

Center for Security, Crisis Management
and Emergency Preparedness

University of South-Eastern Norway

Borre, Norway

e-mail: lasse.berntzen@usn.no

jarle.sorensen@usn.no

marius.johannessen@usn.no

Laurits Rauer Nielsen

Lene Sandberg

Faculty of Social Education, Social
Work and Administration

University College, Copenhagen

Copenhagen N, Denmark

e-mail: laun@kp.dk

lesa@kp.dk

Eric Carlström

Amir Khorram-Manesh

Center for Disaster Medicine and
Gothenburg Emergency Medicine

Research Group (GEMREG),

Sahlgrenska Academy

Gothenburg, Sweden

e-mail: eric.carlstrom@gu.se

amir.khorram-manesh@surgery.gu.se

Abstract— The Erasmus+ project *TeleTraining in Crisis Management* is a collaborative initiative among the University of Gothenburg, the University of South-Eastern Norway, and the University College Copenhagen, aiming to enhance emergency management training through digital solutions. This paper explores the potential of Artificial Intelligence (AI) to improve training programs by generating realistic crisis scenarios and situational updates. Using a simulated emergency water landing of a passenger flight in international waters, the study demonstrates how AI-driven tools, such as ChatGPT, can create dynamic training environments for cross-border emergency response teams. The scenario emphasizes the need for standardized protocols, digital communication platforms, and AI-assisted decision-making in multinational crisis management. The paper further discusses the integration of AI within customized Learning Management Systems (LMS) to facilitate real-time exercises, improve coordination among emergency responders, and enhance crisis preparedness through adaptive and data-driven simulations.

Keywords—artificial intelligence; emergency management training; crisis management training; proof-of-concept; scenarios; ChatGPT.

I. INTRODUCTION

The Erasmus+ project *TeleTraining in Crisis Management* is a joint effort between the University of Gothenburg, the University of South-Eastern Norway, and the University College Copenhagen to explore new methods for crisis and emergency management training, with a focus on collaboration between different emergency services and management levels, both on national and transnational levels.

This paper explores the opportunities to use Artificial Intelligence (AI) to enhance training programs by effectively creating realistic training scenarios. We use ChatGPT to establish an initial scenario and then create situation reports as the scenario unfolds. The aim is to show that ChatGPT and similar tools can add value to emergency training exercises.

Eide, Lund-Kordahl, and Bakken [5] discussed how AI changes crisis management training and exercises. Their discussion is conceptual. Karinshak [3] promotes the idea of using simulation without going into details. A couple of papers discuss the use of ChatGPT in simulations in nursing training [1][8].

For this paper, we will use the following scenario:

A passenger flight from Oslo to Copenhagen performed an emergency landing in water 100 kilometers northwest of Gothenburg, Sweden. The incident occurred in international waters and required immediate cooperation between Danish, Norwegian, and Swedish emergency authorities and response units. The situation escalated quickly, with passengers and crew in distress, necessitating rapid and well-coordinated intervention. Sweden was closest to the scene of the incident, but as the flight originated in Norway and was on its way to Denmark, all three countries got involved. Given the international scope of the crisis, a tri-nation emergency response coordination team was established. This team used digital communication tools and real-time situational awareness platforms to ensure seamless collaboration.

This scenario highlights the critical need for cross-border emergency management training. Effective response requires standardized protocols, digital training platforms, and simulations that enable responders to practice coordinated decision-making under pressure. The operation's complexity demonstrates the importance of continuous, realistic training programs that bridge national and organizational differences in crisis management.

The Erasmus+ project *TeleTraining* aims to develop a learning management system for providing these kinds of training exercises. The project will also introduce new ideas for handling the specific problems of emergency management training. This paper shows an experiment to highlight the feasibility of using AI in crisis management training.

The following section discusses the various forms of digital training and learning management support. Section III discusses the particularities of emergency management

training. Section VI proposes some extensions to existing learning management systems to handle these particularities. Section V elaborates on extending the learning management system with AI to create better training scenarios. Section VI discusses our findings, and Section VII concludes our paper.

II. ONLINE LEARNING

A traditional learning management system operates in an asynchronous manner where students get access to training material and can study at their own pace.

Online training can be asynchronous, synchronous, or blended [6]. A Learning Management System (LMS) supports these three types of learning.

A. Asynchronous learning

Asynchronous learning allows learners to access materials at their convenience without real-time interaction. It includes pre-recorded lectures, discussion forums, and LMS like Moodle and Coursera. Table I analyzes the Strengths, Weaknesses, Opportunities, and Threats (SWOT) of asynchronous learning [4].

TABLE I. SWOT ANALYSIS OF ASYNCHRONOUS LEARNING

Strengths High flexibility Scalable for large audiences Cost-effective Allows learners to progress at their own pace.	Weaknesses: Lack of immediate feedback Potential for learner isolation Requires strong self-motivation and discipline.
Opportunities: Integration of AI for personalized learning paths Expansion into underserved regions, Use of mobile learning applications.	Threats: Reduced engagement compared to live sessions Digital literacy gaps Risk of outdated content if not regularly updated.

B. Synchronous learning

Synchronous training involves real-time instruction through virtual platforms such as Zoom, Microsoft Teams, and Google Meet. It also includes live webinars, virtual classrooms, and Instructor-Led Training (ILT). Table II analyzes the SWOT of synchronous learning [4].

TABLE II. SWOT ANALYSIS OF SYNCHRONOUS LEARNING

Strengths Immediate feedback Interactive learning Increased engagement Real-time discussions	Weaknesses Requires stable internet connection Scheduling difficulties Potential technical issues Dependency on instructor availability.
Opportunities Expansion of global learning communities Integration of AI-driven engagement tools Real-time collaboration across geographies	Threats Cybersecurity risks Digital fatigue Potential technological barriers for learners with limited access.

C. Blended learning

Blended learning [6] combines online and in-person instruction to provide flexible and personalized learning experiences. This approach can boost student engagement and offer access to a wide range of resources. However, it also comes with challenges, including technological hurdles, increased workload for teachers, reduced direct social interaction, and the need for students to have strong self-discipline to succeed in the online parts.

III. EMERGENCY MANAGEMENT TRAINING

Teams are multidisciplinary, coming from the police, fire and rescue, health, and military. The participants are not first responders; they are not out in the field. They are coordinators and managers who need to allocate resources and make decisions.

Taber [7] proposed *active critical learning* as an approach to learning how to act and make decisions in dynamic, unpredictable situations where incidents without precedence escalate rapidly. Active critical learning based on realistic scenarios entails engaging in the learning process, a progression of difficulty, access to peers, experts, and resources, a multimodal design, multiple routing, feedback, working through errors, and debriefing.

The TeleTraining program focuses on incidents involving more than one nation, which introduces some additional challenges due to differences in work practices and culture.

In most cases, emergency management is hierarchical, with a coordinator and team members from different sectors coordinating their contributions. Figure 1 shows the different contributors coordinated by the Joint Rescue Coordination Centre (an example from Norway).



Figure 1. Coordination and Responders.

Emergency management differs from traditional management in several ways. First, the situation is often elusive, and decisions frequently need to be made based on uncertain information. Data is also high volume, high velocity, and in different formats (audio, video). Spatial data is of particular interest, visualized in a Geographic Information System (GIS).

Virtual teams may coordinate emergency management operations. Ad hoc teams will be formed for cross-border incidents. Team members will be in their parent organization, but teamwork will be done through online collaboration.

Berlin and Carlström [2] investigated collaboration among organizations at the accident scene. They found that collaboration is avoided due to uncertainty and lack of

incentives. Training together on scenarios is a way to reduce uncertainty and see the advantages of close collaborations.

IV. CUSTOMIZED LEARNING MANAGEMENT SYSTEM

The TeleTraining program will offer an emergency training course with participants from different groups of stakeholders.

The learning management system will provide study material and assignments for asynchronous studies. Study material includes video lectures, podcasts, textbooks, and research papers. Since synchronous training sessions are an essential part of online emergency training where collaboration is in focus, the learning management system needs to be extended by the possibility for one-to-one and group communication.

We also need a shared workspace where announcements, incoming messages, and tasks are displayed. Tasks should be triaged based on priority. This shared workspace will be the topic of another paper.

Finally, we propose extending the learning management system with an AI-based plug-in to provide operational support and create incoming alerts for the emergency management team. This is the focus of the rest of this paper. Figure 2 shows the customized learning management system.

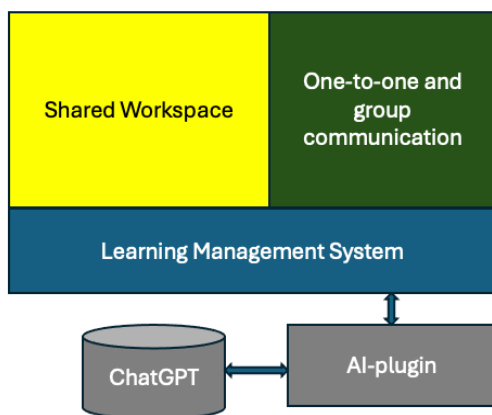


Figure 2. Customized Learning Management System.

A customized Learning Management System (LMS) is a platform uniquely designed to meet an organization's specific needs, differing from standard, pre-built LMS solutions. It offers functionalities, user experiences, branding, and scalability that match the organization's workflows and learning objectives. This customization often includes adding, modifying, or removing features, personalizing interfaces and learning paths, incorporating specific branding elements, ensuring seamless integration with other software, and addressing specialized training requirements. Ultimately, it creates a flexible and adaptable learning environment tailored to precise organizational needs.

V. INTEGRATION WITH AI TECHNOLOGY

Part of the training project involves conducting online synchronous training exercises. However, the participants

receive incomplete information about the incident. AI can help exercise planners improve the quality of simulations.

AI can be used to:

- Develop scenarios
- Provide situation reports and updates
- Create evaluation questions

ChatGPT was asked to create an initial scenario:

Please help create a scenario for emergency management training. A flight from Oslo to Copenhagen was forced to land on the water around 100 km northwest of Gothenburg. There are fresh breezes and rain, and the sea temperature is around 15 degrees Celsius. The extent of the damage is unknown. A Mayday signal was sent at 14:15. There is no more information at the present time.

Output from ChatGPT is shown in the frames with a grey background.

Emergency Management Training Scenario: Flight Emergency Water Landing

Scenario Overview:

At **14:15**, a **Mayday signal** was received from a commercial flight en route from **Oslo (OSL) to Copenhagen (CPH)**, indicating an emergency situation requiring an **immediate water landing**. The aircraft went down **approximately 100 km northwest of Gothenburg**, in open waters.

Weather conditions at the time of the incident:

- **Wind:** Fresh breezes (approx. 30–40 km/h)
- **Rain:** Moderate to heavy rainfall
- **Sea Temperature:** 15°C
- **Visibility:** Limited due to weather conditions

Initial Status:

- The extent of damage to the aircraft is **unknown**.
- The number of survivors is **unknown**.
- Communication with the flight **ceased** after the Mayday call.
- Search and Rescue (SAR) operations need to be **initiated immediately**.

ChatGPT provides the following emergency response activities:

Emergency Response Objectives:

Activate Search and Rescue (SAR) Operations:

- Dispatch **Coast Guard, SAR helicopters, and maritime rescue units** to the last known coordinates.
- Mobilize available **NATO or Swedish Air Force resources** if necessary.
- Deploy **civilian and military vessels** for search and recovery.

Assess and Prioritize Survival Factors:

- **Time-sensitive rescue:** The sea temperature (15°C) presents a **high risk of hypothermia** within **1-2 hours**.

- Strong winds and rainfall may **complicate rescue efforts**.
- **Life rafts & floating debris** may assist survivors—coordinate aerial surveillance to locate them.

Establish a Unified Command & Communication Strategy:

- Coordinate efforts between **Swedish, Norwegian, and Danish emergency services**.
- Use **emergency radio frequencies, satellite data, and air traffic control logs** to track the plane's last movements.
- Deploy **marine and aerial units with thermal imaging and sonar** to locate wreckage and survivors.

Medical & Logistical Preparedness:

- Hospitals in **Gothenburg, Oslo, and Copenhagen** placed on **high alert** for mass casualty incidents.
- **Evacuation procedures** for survivors—triage on ships and helicopters before hospital transport.
- Contingency plans for **handling fatalities and missing passengers**.

Media and Public Communication Strategy:

- **Prevent misinformation**—designate a spokesperson for coordinated press releases.
- Inform **families of passengers** and establish **emergency helplines**.
- Monitor **social media and aviation forums** for additional insights or passenger communications.

The training exercise will consist of four phases:

- Initial response
- Search and Recovery
- Operational Expansion
- Post-incident Management

A. Initial response

The initial response occurs within the first hour. The Mayday signal is received, the joint rescue coordination centers are alerted, search-and-rescue assets are mobilized in all three countries, cross-border communication between national coordinators is established, and the first reconnaissance flight is dispatched.

A participant asks: Where should the first reconnaissance aircraft be dispatched from? (Only show primary option)

Primary Dispatch Location:

Save Air Base (Säve Flygplats, ESGP, Gothenburg, Sweden)

Reason: Closest operational base with Swedish Coast Guard SAR aircraft, ensuring the fastest response time (~12–15 minutes to the crash site).

Another participant asked about the estimated time to get the aircraft airborne:

Immediate Standby (Best Case): 5–10 minutes

- If a Swedish Coast Guard Dash-8 Q300 is on standby and ready for rapid deployment.

Standard Readiness (Likely Case): 15–20 minutes

- Time for crew briefing, pre-flight checks, and taxiing.
- Assumes aircraft is fueled and prepared for emergency deployment.

Delayed Readiness (Worst Case): 30+ minutes

- If the aircraft is not immediately available or requires maintenance checks before takeoff.

B. Search and recovery

The search and recovery phase begins 1 to 4 hours after the incident. This phase includes identifying debris and establishing potential survivor locations. Search and rescue helicopters and vessels then move in to pick up victims. Survivors receive stabilizing treatment before being forwarded to the appropriate medical facility.

SITUATION REPORT – 14:40 CET

From: Swedish Coast Guard SAR Aircraft (Dash-8 Q300)

Callsign: SE-SAR 1

To: Joint Rescue Coordination Center (JRCC) Gothenburg

Current Status:

The aircraft reached the search area at 14:38 CET (~100 km NW of Gothenburg).

Weather conditions:

- Wind: Fresh breeze (~30–40 km/h)
- Rain: Moderate, reducing visibility
- Sea state: Rough, waves approx. 1.5–2 meters
- Sea temperature: 15°C

Observations:

- Debris field spotted: Approximately 2 NM south of last known coordinates.
- No sign of the main fuselage yet.
- Possible life rafts sighted: Infrared imaging detects multiple heat signatures in the water.
- No visible fire or smoke.

Next Actions:

- Conducting low-altitude pass for detailed assessment.
- Deploying emergency survival pods to survivors.
- Relaying coordinates to SAR helicopters & naval units.

Urgent: Survivors in water—immediate extraction required. Risk of hypothermia within 1-2 hours.

The accident with the location was confirmed. Additional search and rescue resources need to be activated.

A participant asked for additional search and rescue resources with a situation update.

SITUATION UPDATE – REQUEST FOR ADDITIONAL SAR RESOURCES – 14:45 CET

From: Joint Rescue Coordination Center (JRCC) Gothenburg

To: All SAR Units & Authorities Involved

Request for Additional SAR Assets:

1. Air Support (Urgent)

Swedish and Norwegian SAR Helicopters

Request immediate dispatch of 2–4 SAR helicopters from:

- Swedish Air Force (F7 Sätenäs) – Nearest base (~20 min ETA).
- Norwegian 330 Squadron (Sola Air Base) – (~40 min ETA).
- Danish EH101 SAR Helicopters (Skrydstrup) – If needed (~50 min ETA).

Task: Immediate extraction of survivors from water.

2. Maritime Response

- Rescue Vessels & Coast Guard Ships
- Deploy high-speed rescue boats from Gothenburg & nearby coastal stations.
- Request support from Swedish Navy (Karlskrona Base) for larger assets if needed.

3. Fixed-Wing Support

Additional Reconnaissance & Support Aircraft

- Request Swedish Air Force Gulfstream IV (SIGINT) to assist in debris tracking.
- Request Norwegian P-8 Poseidon maritime patrol aircraft (if available).

Immediate Actions:

- Directing first SAR helicopter to survivor location (~ETA 14:55).
- Marking survivor locations with emergency beacon drops.
- Relaying coordinates for coast guard and navy vessels.
- Critical: Survivors are exposed to 15°C water—risk of hypothermia within 1–2 hours. Immediate extraction is top priority.

C. Operational Expansion

After the search and recovery phase, a full-scale maritime and aerial search continues to identify additional survivors. Survivors are brought to appropriate medical facilities, and new resources arriving are used in search and rescue operations.

A participant asked for a situation report.

SITUATION REPORT – 16:15 CET

From: Joint Rescue Coordination Center (JRCC) Gothenburg
To: All SAR Units & Authorities Involved

1. Current Status of the Search and Rescue Operation

Incident: Commercial aircraft forced water landing ~100 km NW of Gothenburg.

Initial Mayday received: 14:15 CET.

First SAR aircraft on scene: 14:38 CET (Swedish Coast Guard Dash-8 Q300).

Weather conditions:

Winds: 35-40 km/h (fresh breeze)

Sea state: Rough, waves 2–2.5 meters

Rain: Intermittent, reducing visibility

Sea temperature: 15°C (risk of hypothermia within 1–2 hours)

2. Assets Deployed and Actions Taken

Airborne SAR Assets:

- Swedish Coast Guard Dash-8 Q300 (SE-SAR 1) – Overwatch & Coordination

- Swedish Air Force SAR Helicopters (2 UH-60 Black Hawks) – Ongoing Rescue
- Norwegian EH101 SAR Helicopter (Sola Air Base) – En Route (ETA 16:25)
- Danish EH101 SAR Helicopter (Skrydstrup) – En Route (ETA 16:40)
- Norwegian P-8 Poseidon (Maritime Patrol Aircraft) – Deployed for Wreckage Location

Maritime SAR Assets:

- Swedish Coast Guard Vessel (KBV 001 Poseidon) – En Route, ETA 17:00
- High-Speed Rescue Boats from Gothenburg – Arriving at Search Area
- Civilian Ships (Diverted Commercial Vessels in Vicinity) – Assisting SAR

3. Current Findings and Rescue Efforts

Debris Field Confirmed:

Located approx. 2–3 NM from last known aircraft position.

Floating wreckage includes aircraft parts, luggage, and life jackets.

Survivors Located & Rescued:

Confirmed Survivors: 23 individuals recovered (some in life rafts, others in open water).

Condition: Several cases of moderate hypothermia, no critical injuries reported yet.

First rescues by Swedish SAR helicopters – transported to Gothenburg hospitals.

Missing Persons:

Estimated ~70+ passengers and crew still unaccounted for.

Search extended to 10 NM radius from initial crash site.

No Sign of Main Wreckage (Fuselage):

Wreckage may have submerged.

Norwegian P-8 Poseidon conducting sonar scans for underwater debris.

4. Next Steps & Immediate Priorities

Continue Helicopter Rescue Operations

Priority: Recover survivors from life rafts and open water before hypothermia sets in.

Deploy More Naval Assets for Survivor Recovery & Wreckage Location

Swedish and Norwegian navy divers on standby for underwater search.

Civilian ships instructed to assist in search & survivor recovery. Expand Search Area

Given wind & current drift, survivors and debris may have moved further away.

Reconnaissance flights expanding search to a 15 NM radius.

Establish Emergency Response Centers in Gothenburg & Oslo

Coordination of survivor medical treatment & family notifications.

Swedish & Norwegian authorities managing public communication.

5. Key Challenges

Weather conditions deteriorating – rough sea impacting rescue ops. Limited daylight – sunset approaching (~17:30 CET), night SAR ops needed.

Time-sensitive – Risk of hypothermia increasing for those still in the water.

6. Summary

23 survivors rescued, 70+ still missing
Helicopter & naval rescues ongoing
No sign of main fuselage – P-8 Poseidon scanning for underwater wreckage
Search area expanding as wind & currents move debris and survivors
SAR operations remain in full emergency mode – Additional resources may be requested.

Later, a second participant asked for a situation update.

SITUATION REPORT – 18:15 CET

From: Joint Rescue Coordination Center (JRCC) Gothenburg
To: All SAR Units & Authorities Involved

1. Current Status of the Search and Rescue Operation

Incident: Commercial aircraft forced water landing ~100 km NW of Gothenburg.
Initial Mayday received: 14:15 CET.
First SAR aircraft on scene: 14:38 CET.
Weather conditions worsening:
Winds: 40–45 km/h (strong breeze)
Sea state: Rough, waves reaching 3 meters
Rain: Heavy, further reducing visibility
Sea temperature: 15°C (survival time in open water estimated at 1–2 hours)
**Nightfall approaching (~17:30 CET) – SAR operations now in low-visibility conditions.

2. SAR Assets Deployed and Actions Taken

Airborne SAR Assets:

- Swedish Coast Guard Dash-8 Q300 (SE-SAR 1) – Aerial Coordination (Returning to Base for Refuel at 18:30)
- Swedish Air Force UH-60 Black Hawks (2) – Rescuing Survivors
- Norwegian EH101 SAR Helicopter (Sola) – Recovering Survivors, Low on Fuel (RTB at 18:45)
- Danish EH101 SAR Helicopter (Skrydstrup) – Ongoing Search for Survivors
- Norwegian P-8 Poseidon (Maritime Patrol Aircraft) – Conducting Sonar Scan for Wreckage

Maritime SAR Assets:

- Swedish Coast Guard Vessel (KBV 001 Poseidon) – Arrived at Scene, Recovering Survivors
- High-Speed Rescue Boats (Gothenburg) – Multiple Survivors Recovered
- Civilian Ships (Diverted Vessels) – Assisting SAR, 2 Ships Actively Rescuing Survivors
- Swedish Navy Corvette (HMS Nyköping) – En Route, ETA 19:00 for Night Operations

3. Current Findings and Rescue Efforts

Debris Field Widened:
Floating wreckage spread over 5–6 NM radius, increasing search difficulty.
No large fuselage sections found.
Survivors Rescued (Confirmed):
41 individuals recovered (some in life rafts, others in open water).
Condition:
13 survivors suffering from severe hypothermia, airlifted to Gothenburg hospitals.

28 others in moderate or mild condition, receiving medical treatment on rescue vessels.
Survivor statements confirm aircraft broke apart upon impact with the water.
Missing Persons:
Estimated ~50+ passengers and crew still unaccounted for.
Increased risk of fatalities due to cold exposure.
No Sign of Main Wreckage (Fuselage):
Norwegian P-8 Poseidon continuing sonar scan – no submerged wreckage located yet.
Swedish Navy divers preparing for underwater search upon daylight.

4. Next Steps & Immediate Priorities

Continue Helicopter Rescue Operations Until Fuel Limits Require Rotation
Focus on recovering survivors from drifting rafts and open water.
Danish EH101 to take over aerial overwatch as Swedish/Norwegian helicopters rotate out.
Expand Maritime Search Efforts
Additional vessels arriving for overnight search & recovery.
Request possible assistance from Norwegian or Danish naval assets.
Nighttime Search Operations Initiated
Thermal imaging cameras being deployed.
Civilian ships equipped with spotlights assisting SAR.
Family Assistance & Crisis Response Centers Activated
Survivor medical triage ongoing in Gothenburg.
Swedish & Norwegian authorities coordinating passenger family notifications.

5. Key Challenges

- Weather conditions worsening – strong wind & high waves impacting SAR efforts.
- Nightfall reducing visibility – thermal imaging and sonar required.
- Cold exposure risk rising – immediate survivor recovery still top priority.
- SAR helicopters reaching fuel limits – rotations required to maintain coverage.

6. Summary

- 41 survivors rescued, 50+ still missing
 - Night SAR operations initiated
 - No sign of main fuselage – Norwegian P-8 continuing sonar scans
 - Search area expanded to ~10 NM as wind & currents push debris and survivors further
- SAR operations remain in full emergency mode – Additional assets may be requested.

D. Post-incident Management

During the first three phases, the focus is on life-saving efforts. When the life-saving efforts are finished, there are still things to be done. Survivors and non-survivors need to be recorded together with missing persons.

Aircraft recovery operations need to start (e.g., recovery of black boxes containing vital information about what happened. An incident investigation needs to be launched.

A participant asks for a post-incident report summary.

POST-INCIDENT REPORT SUMMARY

Incident: Emergency Water Landing – Commercial Flight from Oslo to Copenhagen

Date: [Insert Date]

Time of Mayday: 14:15 CET

Location: ~100 km NW of Gothenburg, Sweden (North Sea)

Weather Conditions:

Winds: 40–45 km/h (strong breeze)

Sea state: Rough (waves 2.5–3 meters)

Rain: Heavy at times, reducing visibility

Sea temperature: 15°C

1. Incident Overview

At 14:15 CET, air traffic control received a Mayday distress signal from a commercial aircraft en route from Oslo (OSL) to Copenhagen (CPH), reporting an emergency requiring an immediate water landing. Contact was lost shortly thereafter.

At 14:38 CET, a Swedish Coast Guard reconnaissance aircraft arrived at the scene and confirmed a debris field in the water approximately 2 NM from the last known coordinates. Multiple life rafts and individuals in the water were detected using thermal imaging.

2. Search and Rescue (SAR) Response

2.1 Deployed SAR Assets

- Airborne Assets:
Swedish Coast Guard Dash-8 Q300 – Aerial reconnaissance and coordination
- Swedish Air Force UH-60 Black Hawks (2) – Survivor extraction
- Norwegian EH101 SAR Helicopter (Sola Air Base) – Survivor extraction
- Danish EH101 SAR Helicopter (Skrydstrup Air Base) – Night SAR operations
- Norwegian P-8 Poseidon (Maritime Patrol Aircraft) – Sonar search for submerged wreckage

Maritime Assets:

- Swedish Coast Guard Vessel (KBV 001 Poseidon) – Survivor recovery and medical assistance
- Multiple high-speed rescue boats from Gothenburg and nearby stations
- Civilian vessels diverted from nearby shipping lanes
- Swedish Navy Corvette (HMS Nyköping) – Arrived for night SAR and debris recovery

3. Incident Outcome

3.1 Survivor Recovery

Total survivors recovered: 47

Medical conditions:

18 cases of severe hypothermia, requiring intensive care

29 cases of moderate to mild injuries, treated on scene or at local hospitals

Survivors reported that the aircraft broke apart on impact with the water.

3.2 Fatalities and Missing Persons

Confirmed fatalities: 19 (bodies recovered from the water)

Missing persons: 23 (presumed deceased, search efforts ended)

3.3 Wreckage & Investigation

No large fuselage sections located during initial SAR operations. Norwegian P-8 Poseidon sonar scans detected submerged wreckage at approximately 60 meters depth.

Swedish and Norwegian Navy dive teams scheduled for a detailed wreckage recovery operation.

Investigation agencies (Swedish SHK & European Aviation Authorities) coordinating recovery for black box retrieval and forensic examination.

4. Challenges Encountered

- Severe weather conditions (strong wind, rain, and high waves) delayed rescue efforts.
- Nightfall significantly reduced visibility, requiring thermal imaging and sonar assistance.
- SAR helicopters had to rotate frequently due to fuel limitations and poor weather conditions.
- Cold exposure risk was a critical factor—survival time in open water was estimated at 1–2 hours.

5. Recommendations for Future Response

- Enhanced Rapid Deployment of SAR Helicopters: Faster coordination with multiple agencies for immediate launch.
- Prepositioning of Maritime SAR Assets: Increase readiness of naval and coast guard vessels in high-risk areas.
- Cross-Border SAR Coordination Improvements: Improved protocols between Swedish, Norwegian, and Danish authorities.
- Weather-Adapted Search Techniques: Expand use of drift analysis modeling to predict survivor locations more accurately.
- Underwater Recovery Capabilities: Strengthen rapid deployment of navy dive teams and remotely operated vehicles (ROVs) for submerged wreckage.

6. Conclusion

The combined efforts of Swedish, Norwegian, and Danish SAR teams resulted in the successful rescue of 47 survivors.

However, 42 lives were lost due to the severity of the crash, weather conditions, and time required for rescue. Aviation and maritime authorities continue investigations to determine the cause of the incident and ensure improved emergency preparedness in the future.

Status: SAR operations concluded – Incident investigation ongoing.

VI. DISCUSSION

One objective of this paper was to investigate whether ChatGPT could deliver realistic content for scenarios and situation reports. We have presented one scenario but have also used it for other transnational incidents, including a cross-border wildfire, a solar storm, a pandemic, and a fire aboard a passenger ferry. In these cases, ChatGPT has helped create more realistic scenarios.

Experts have verified the answers from ChatGPT. The airborne and maritime SAR resources are correctly identified and located. The Norwegian got the P8 Poseidon naval patrol aircraft, and the Swedish used the Dash 8, as shown. The Swedish also use Black Hawk helicopters, and the KV

Poseidon is a real resource. Flight times and times to be airborne seem realistic. Estimations of cold exposure risk have been verified.

In some cases, ChatGPT was asked to elaborate on answers. For example, *why did you suggest Sola Air Base instead of Rygge Air Base* (which is closer)?

While **Rygge Air Base (ENRY)** is geographically closer to the search area than **Sola Air Base (ENZV)**, there are a few key reasons why Sola is prioritized for SAR helicopter dispatch:

1. Dedicated Search and Rescue (SAR) Squadron at Sola

- 330 Squadron of the Royal Norwegian Air Force operates Westland AW101 (EH101) SAR helicopters from Sola Air Base.
- These helicopters are specialized in long-range maritime rescue and are equipped with winches, medical capabilities, and thermal imaging systems, making them the best choice for this type of operation.

2. Rygge's Primary Focus is Military Operations

- Rygge (ENRY) is mainly a military base with F-35 fighter operations and limited SAR assets.
- There may be some SAR availability, but Sola remains the primary Norwegian SAR hub for maritime operations.

3. Faster Mobilization and Response Time

- Sola is already on high readiness for North Sea SAR operations.
- Sola's EH101s are better suited for rough weather conditions and long-range maritime missions.
- Despite a slightly longer flight time (~40 min from Sola vs. ~30 min from Rygge), Sola's helicopters are likely to be mission-ready faster.

Conclusion

Sola Air Base is the best choice for Norwegian SAR helicopter support due to its dedicated 330 Squadron, specialized aircraft, and high readiness for maritime rescues.

If additional assets are required, Rygge or Danish EH101s from Skrydstrup can be requested as backup.

VII. CONCLUSION

This paper has explored the potential of AI, specifically ChatGPT, in enhancing emergency management training through realistic scenario generation and adaptive situational updates. By integrating AI-driven simulations into a customized learning management system, training exercises can become more dynamic, data-driven, and reflective of real-world challenges. Our case study on a transnational air emergency demonstrated the capability of AI to generate coherent, contextually relevant crisis scenarios and support decision-making processes.

The AI tool can function both as a resource for the players and as an adversary controlled by the exercise leader. The player can provide adequate suggestions regarding status, risk assessments, and appropriate actions if the participants formulate the right questions. An AI opponent

can generate new challenges during an exercise, such as escalating crises, the need for reinforcement measures, and collaboration. A trained AI can also create an evaluation of the players' abilities, such as analysis, decision-making skills, and redundancy.

The results suggest that AI can significantly improve emergency training by facilitating cross-border coordination, refining decision-making processes, and enhancing real-time situational awareness. However, human oversight remains critical to validate AI-generated content and ensure alignment with established emergency protocols. Future work will focus on refining AI-assisted scenario development, integrating real-time data feeds, and further adapting AI tools for emergency response training across diverse crisis types.

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