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Research Article

Incident Command Management System (icms-Fire and Rescue Fire Fighting Vehicle

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ABSTRACT

This section will define Incident Command Management System (ICMS). The section will provide you with a brief and its evolution into an effective system for emergency management. This section will also introduce the ICMS organization and describe each ICMS function and its responsibilities during an incident. ICMS is the model tool for command, control, and coordination of a response and provides a means to coordinate the efforts of individual agencies as they work toward the common goal of stabilizing the incident and protecting life, property, and the environment. ICMS uses principles that have been proven to improve efficiency and effectiveness in a business setting and applies the principles to emergency response.

Keyword: ICMS- Incident Command Management System, ARFF- Aircraft Rescue and Fire Fighting, CFT- Aiorport Crash Fire Tender, FT-Fire Tender

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INTRODUCTION

The principal objective of a Rescue and Fire Service is to save lives in the event of an accident or incident occurring at, or in the immediate vicinity of, an accident site. The Rescue and Fire service is provided to create and maintain survivable conditions, to provide egress routes for occupants and to initiate the rescue of those occupants unable to make their escape without direct aid. The provision of emergency exits and their availability to be opened from the inside and outside the accident site is of primary importance in Rescue and evacuation operation at the time of incident / accident.

The Incident Command Management System (ICMS) is a modern training methodology for standardized on-site management system designed to enable effective, efficient incident management by integrating a combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure. The ICMS is used to manage an incident or a non-emergency event and can be used equally well for both small and large situations i.e. High Rise Building Fire, Oil Fire, Hospital Fire, Hotels and Resturant Fire, Industry Fire, Flood, Earthquake, Other Disaster scenarios Terriorist Attack, Riots, Security Related scenarios and many more at ICMS Training Center to give exposure to these trainees to handle actual situation. Different scenarios can be developed in simulator for the purpose of training. The ICMS is a usable, adaptable, and well-tested approach to emergency management, that is used by first responder agencies and industry.

THE SUCCESS OF THE ICMS

- Modular Organization (can be easily expanded or contracted as needed),
- The Use of Common Terminology,
- Unified Command Structure,
- Span-of-Control,
- Resource Management,
- Command Posts,

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- Communication,
- Decision Making,
- Establishing Command,
- Incident Action Plans,
- Incident Commanders,
- Strategy and Tactics,
- Policy, Procedures and Protocols,
- Size -Up, Pre-fire Planning and Situational Awareness,
- Mobile Units,
- Mobile Command Vehicles,
- Personnel Accountability,
- Training.

FEATURES AND FUNCTIONS

When an incident is too large or too complex for just one person to manage effectively, the Incident Commander may appoint Rescue and Fire Service Staff Positions, called Ground Fire Chiefs, to oversee major components of the Operation.

These positions include

- Operations "the do-ers"
- Planning "the thinkers"
- Logistics "the getters"
- Finance "the payers"

Operations ("The Do-ers"):

The Operations Section is responsible for all tactical operations at the incident. This section carries out tactical goals identified by the Incident Commander including fighting the fire, performing rescues, treating patients, and other tasks to deal with the emergency. All tactical positions and operations report through the Operational Fire Chief.

- Branches
- Groups and Divisions
- Strike Teams and Task Forces
- Single Resources

Planning ("The Thinkers")

The Planning Section is responsible for the collection, evaluation, dissemination, and use of information relevant to the incident. This Section reports directly to the Incident Commander. Units within the Planning Section include: Resources Unit, Situation Unit, Documentation Unit, Demobilization Unit and Technical Specialists.

Logistics ("The Getters")

The Logistics Section is responsible for providing facilities, services, and materials for the incident. In a large-scale event, the Logistics Section is typically divided into two branches.

- The Service Branch
- The Support Branch

Finance/Administration ("The Payers")

The Finance/Administration Section is responsible for the accounting and financial aspects of an incident, as well as any legal issues that may arise. Units within the Finance/ Administration Section include:

- Time Unit,
- Procurement Unit,
- Compensation/Claims Unit,
- Cost Unit.

COMMAND STAFF FUNCTIONS

Command Staff Positions include Safety Officer, Liaison Officer and Information Officer. These functions are performed by the Incident Commander until the Span of Control or Incident Nature, they be delegated.

Safety Officer

Incident safety should be a primary concern of all those who respond to the aid of the community or jurisdiction they serve. To help minimize the risk to responders, one of the ways the Incident Command Management System (ICMS) provides for responder safety is by giving the Incident Commander (IC) the ability to appoint and use a Safety Officer.

Duties of the Incident Commander

- Determining Strategy,
- Selecting Incident Tactics,
- Setting the Action Plan,
- Developing the ICS Organization,
- Managing Resources,
- Coordinating Resource Activities,
- Providing for Scene Safety,
- Releasing Information about the Incident,
- Coordinating with Outside Agencies.

LEVELS OF COMMAND

The Incident Command Management System (ISMS) includes three levels of command, with a set of responsibilities being assigned to each level.

- **Strategic Level:** Prioritized strategic goals must be formulated prior to the development of tactical assignments. Strategic goals are broad-based objectives that commonly answer the question "what needs to be one?" Rescue is an example of a strategic goal.
- **Tactical Level:** Tactics are more specific than strategies but are based on strategic goals. Tactics commonly answer the questions "how are we going to accomplish this goal?" For example, a "right-hand primary search" could be a tactic that would be chosen to support the strategic goal of rescue.
- **Task Level:** The task-level involves the "doing part" of the action plan. This is based primarily on training, Operational Guidelines and established practices. Task level assignments also answer the questions "who is going to do it and what will they need?" An example would be "conduct the primary search".

SIZE-UP-SYSTEM

The Incident Command Management System has developed a size-up system that includes three phases:

- **Pre-Incident information:** Phase one considers what you know before the incident occurs. Information about the incident/accident, such as type of incident, airport building or other building layout and construction type, availability of fire fighting equipment and appliances, type of aircraft, built-in fire protection systems in building , nature of the contents and construction type are all needed to perform an accurate size-up. Pre Incident information should also identify water supply sources including their: location, accessibility and capacity
- **Initial size-up:** The second phase of the size-up begins with receipt of an emergency call, locate the fire, isolate the flow path, cool from a Safe distance, extinguish the fire and then rescue and salvage are considered tactics of opportunity added in as necessary. While most agree that the latest research can improve firefighter safety, they struggle to translate the research into fireground tactics and implement that change in a successful model of SLICERS fire fighting can developed to "operationalize" fire dynamics research. This acronym rethinks the tactics of old and incorporates the latest research into operations with a focus on fire flow path and rapid water for cooling.
- **Ongoing size-up:** The third phase addresses the need to continually size up the incident as it evolves. This phase includes ongoing analysis of the situation and the ongoing evaluation of the effectiveness of the plan being executed.

The ongoing size-up requires a constant flow of feedback. The Incident Commander needs to know when:

- An assignment is completed,
- An assignment cannot be completed,
- Additional resources are needed,
- Resources can be released,
- Conditions have changed,
- Additional problems have been identified,
- Emergency conditions exist.

OPERATIONAL MODE

Offensive Mode

This mode is chosen when firefighters are going to enter the incident/accident site to fight the fire and/or rescue occupants.

Defensive Mode

A defensive mode is appropriate when initial attack efforts are not successful or when a fire has progressed to the point. A defensive mode is also appropriate when insufficient resources or water are available to fight a fire. It should be noted that once an operational mode is chosen it can be changed. For example, an offensive operational mode may initially be chosen to perform a rescue or to fight a fire, once complete the decision can be made to switch to defensive mode.

Transitional Mode

The transitional mode used when initial crew(s) arrive one scene and are tackle with smoke and flames. The initial tactic is to use action/confine the fire. The goal is to reset the fire clock, buying time for resources to arrive.

FIRE TRAINING CENTERS

Fire Training Centers are now moving ahead from traditional training methodology and adopting modern means of training. ICMS is advance training technology to create real life fire scenario viz. Aircraft Crash, Terminal Building Fire, High Rise Building Fire, Hotel & Restaurant Fire, Flood, Earthquake, Other Disaster Scenarios, Terrorist Attacks, Riots Security Related Scenarios and more at Training Center to give exposure to these trainees to handle actual situation. Almost more than2000 different scenarios can be developed in simulator for the purpose of training. Adaptation of such advancement in training technology is always beneficial compared to tradition methods of training.

The Simulation System is software-based tool which helps trainees to understand concepts by experience, acquire practical knowledge in a relatively short timeframe, practice decision making in critical situations and experience situations that rarely occur in real life. It enables incident responders to become better at what they do and develop the skills that are crucial in their important, risky work. The Simulator System is basically very flexible, time saving, cost effective and sustainable method of simulation. ICMS software has been used by organizations worldwide to provide complete multi-agency emergency management training.

Components of Simulator

The Training centre consist of two major components of Simulator which are as mentioned below:

- Incident Command Management System (Fire/Disaster) Simulator
- Airport Rescue and Fire Fighting /Fire Vehicle Driving Simulator

THE ICMS WILL PROVIDE HIGHLY REALISTIC TRAINING IN THE FOLLOWING AREAS

- Airport Rescue and Fire Fighting/Other Rescue and Fire Fighting Familiarization, Driving and Equipment Operation,
- Emergency Preparedness,
- Risk Assessment,
- Disaster Management (Floods, Earthquake, Hurricanes and Tropical Storms, Wildfire, Landslide and Debris Flow, Tornados, Tsunamis, Thunderstorm and Lightning, Extreme Heat and Cold etc.),
- Emergency Plan Exercising and Validation,
- Airport and Aircraft Familiarization and Orientation,
- Hazardous Materials Incidents,
- Airport Security,
- Terrorist Attacks etc.

The training system designed and incubated is a net working of training Station, includes an Exercise Control (Instructor) station, an incident Commander stations, including an Exercise Control (Instructor) station, an Incident Commander Station Training Stations and Fire station. Also, a video wall system is installed in a Briefing/ De Briefing Room that can function as the Command Post/ Emergency Operations Centre during large- scale training exercises, as well as for debriefing and instructions.

APPLICATION SOFTWARE

The Simulation platform is designed to support education, training and assessment of incident commanders for fire & rescue, law enforcement and medical services. The simulation platform supports training and assessment of all levels of command, from operational on scene command

to strategic commanders at city, state or national international level. The vision is to help save lives by creating flexible, reliable & user-friendly simulation tools where learning is key and the instructor is in control.

THE SIMULATOR

The Simulator uses state of the art, game-based visualisation, and simulation technology to create highly realistic incident scenarios. The instructor can build any incident scenario from the virtual 3D library with thousands of 3D locations, vehicles, avatars, objects and incident types like fire, smoke and hazardous materials. During a training session, one or more trainees can walk, drive or fly around in the simulated reality of the incident and respond to the situation at hand. The instructor meanwhile has full control over the course of events in the scenario and can influence the course of events to match the trainee learning objectives and competence level.

THE LAYOUT OF THE ICMS TRAINING CENTRE

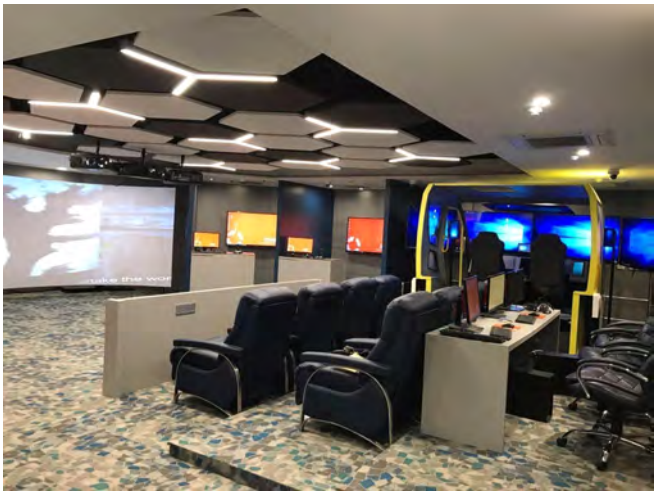
The ICMS Training Centre covers

The ICMS Training area with Incident Commander and Sector Commander stations: - The ICMS Training Room is designed to allow an Incident Commander and Sub-Commanders or Units to manage a large-scale airport incident response. The Incident Commander Station is where the Incident Commander and/or Command Team command the on-scene operations. The Incident Commander has a complete view of the incident on a 130 Degree visual display. The Incident Commander communicates with his staff either person- to-person or by radio and make decisions based on the information he has gathered and the observations he has made. These stations can be manned by company, platoon or section leaders, operations chiefs, or other involved personnel regardless of seniority level. The commanders communicate by radio and give radio commands to the virtual resources. These resources will be deployed by the Facilitator.

Each Team Training Station has a large 65" diagonal Ultra High-Definition LED monitor for viewing the incident, a Joystick for moving around the virtual incident scene, a desk for laying out plans and maps, and a workstation along with 24" Monitor.

The ICMS Training Room is supervised by one or more Instructors and Facilitators. The Instructor(s) and Facilitator(s) control the incident scenario from the Exercise Control Station. The Facilitator deploys the virtual

Training Cubicle **Projector Area** **RFF Cubicle**



resources based on the commands received from the trainees. He/she also control the escalation and de-escalation of the incident. In most cases, the Instructor(s) will be in the training room(s) and use observation forms that can be logged into the system after the evaluation of the exercises with the trainees.

The Driving Simulator

The driving simulator is utilized for training drivers and operators of the airport Crash Fire Tenders (CFT)/ Fire Tender. In the ARFF CFT/Fire Tender simulator, the trainees are able to drive to the incident scene, and perform firefighting operations and Turret operations from within the CFT/FT minicab station. The trainees communicate by radio with the incident commander and other involved trainees. The CFT minicab station provides airport firefighting crew commanders and drivers the opportunity to train operational skills such as

- Vehicle and Turret Operation,
- Basic Driving and Positioning,
- Fire Fighting and Rescue Operations,
- Spillage Containment,
- Damage Mitigation,
- Resource Control,
- Teamwork & Command and Control.

The integrated physics-based effects ensure that incidents/ accidents are realistically simulated, including the fire and smoke. Vehicle agent capacity and application rates of agents are also realistically simulated. The vehicle dynamics package is based on the actual fire fighting vehicle, therefore, acceleration, deceleration, driving speed, taking curves, vehicle suspension, rollover, and vehicle payload are all accurately simulated.

The Fire Vehicles Station consists of a Minicab base frame, a five (5) 65" monitor visual display system (including roof view), the fire vehicle simulator has interchangeable different OEM dashboards and centre console) with operational joysticks, switches and indicators, two (2) vehicle seats with full motion simulation, a steering wheel and pedal assembly with force loading, and a sound system.

Briefing/Debriefing Area

Within the Briefing Room the instructors can brief and debrief the trainees. The Briefing / Debriefing room consist of video wall for After Action Review. The video wall is also integrated with the Simulator which helps in summarizing and analysing the exercises carried out at ICMS Centre.

The room is designed as an additional training room to allow Command Post/Emergency Operations Centre staff

to participate in the exercise. In a major airport emergency exercise, this room would be used the Crisis Management Team to coordinate the response, business continuity and recovery measures.

Network and UPS Rooms

The ICMS Training Centre has been equipped with a high quality, resilient IT infrastructure. The climate-controlled network room contains network and server Racks with raised flooring. The UPS room includes the main panel, UPS Panel.

Customizations for Customer

The ICMS Simulator has been customized to match the reality to customers. In addition to these custom-made a large library of other 3D training locations is to be available including a newly created large generic airport/city/oil/ industries environment.

REVENUE GENERATION POTENTIAL

'ICMS and Fire Fighting Vehicle Simulator' has great revenue generation potential for Training Center. Installation of such advanced training instrument will attract a greater number of trainees from different fire service, safety professional, private airports, other countries, state governments and disaster personnel and security forces which consequently increase the revenue and recover the cost.

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