

# Status of the U.S. DoD Munitions Safety Program – Program Management Pillars

Luke Robertson, Director Program Evaluation; Department of Defense Explosives Safety Board; Alexandria, VA

Julie Finnegan, Safety Engineer, Department of Defense Explosives Safety Board; Alexandria, VA

Kris Bigej, Safety Engineer, Department of Defense Explosives Safety Board; Alexandria, VA

Keywords: Department of Defense Explosives Safety Board (DDESB), Explosives Safety Management Program (ESMP), Oversight, Explosives Safety and Munitions Risk Management (ESMRM)

## ABSTRACT

The concept of explosives safety within the U.S. Department of Defense has evolved considerably over the last century. The historic role of the Department of Defense Explosives Safety Board (DDESB) and its forerunners included inspecting or providing a survey of each U.S. Military installation where military munitions are present. In an effort to better manage and provide oversight to the Department's explosives safety program, the DDESB shifted away from compliance-type inspections to programmatic reviews of the DoD Services and Components. Over the last decade, the DDESB has evaluated each of the Services (U.S. Army, Navy, Air Force and Marine Corps) from a programmatic prospective. These reviews have afforded a unique opportunity to develop a more holistic view of how each Service manages explosives safety, given their unique and complementary missions, and to define the core management pillars of an explosives safety program regardless of mission. In this paper, these elements, developed over the last decade of evaluation activities by the DDESB Staff, are outlined and are currently being used to update explosives safety policy within the Department. At the core of these pillars is a cadre of dedicated personnel who are adequately trained and resourced to oversee the complex and massive DoD munitions enterprise. They ensure that the public, DoD personnel and mission assets are adequately protected from the potential consequences of an explosives safety-related accident as well as manage conditions to reduce the probability of such an accident's occurrence. With increasing constraints on land usage, larger and more complex weapons systems and platforms, and the increasing reliance on integrated contract support to the munitions enterprise, the explosives safety landscape is becoming more complex. The DDESB staff views the pillars outlined in this paper as the firm foundation for another successful century in managing the risks associated with military munitions throughout their lifecycles.

# Status of the U.S. DoD Munitions Safety Program – Program Management Pillars

## Introduction

Inspection and oversight is an essential part of the DoD's Explosives Safety Management Program (ESMP). The scope of the DoD's facility and munitions enterprise has grown since the Board's inception in the 1920's, and the role of the Services has expanded to include developing mature explosives safety centers of expertise and compliance programs that include installation self-assessments, leading to the evolution of the DDESB's role in the inspection and oversight process. The DDESB's current oversight program, which has been in place over the last decade, has shifted from focused surveys to programmatic evaluations. The prior surveys produced findings for each installation to correct. As part of this oversight process evolution, the DDESB Staff has identified program management pillars, core elements of an effective ESMP that are common throughout the DoD Services. As DoD explosives safety policies are updated, these pillars will be further developed and incorporated to support Service-level ESMP planning, development and oversight.

## A Brief History of U.S. Munitions Safety Programs

At the turn of the 20<sup>th</sup> century in the United States, the Bureau of Explosives, a commercial cooperative of railroad self-governance, developed explosives safety regulations and coordinated the promulgation of standards with the Interstate Commerce Commission. In 1911, an American Table of Distances (ATD) was proposed by the Bureau. At the time, only Massachusetts had adopted a uniform standard, that being the English Table of Distances. After the Lake Denmark Explosion in 1926, the newly formed Joint Army Navy Munitions Board adopted the ATD in 1928 and took on a primary inspection role. The ATD, comprised of data based on 100+ accidents, was used by the U.S. Military until the late 1940's when analysis of an additional 66 accident events concluded that the ATD was inadequate for addressing more powerful military explosives.

Accidents have always formed the core of explosives safety distances and regulations; other major formative disasters of note are:

*The Great Halifax Explosion* – at the height of WWI in December of 1917, the French *Mont Blanc* collided with another ship while carrying 2,300 tons of picric acid, 200 tons of TNT, 35 tons of high-octane gasoline, and 10-tons of gun cotton. The *Mont Blanc* caught fire and detonated after drifting near the shoreline and attracting a large crowd of spectators. The explosion killed more than 1,800 and injured 9,000 and destroyed the north end of the city of Halifax, Canada. This accident highlighted the risk posed by military shipments in public waterways. (History.com, 2010)

*The Port Chicago Disaster* – in July of 1945, with the U.S. campaign in the Pacific underway, the SS *Quinault Victory* and the SS *E.A. Bryan* exploded during loading operations. 4,600 tons of munitions on the ships as well as another 400 tons on nearby railcars exploded in several large successions. 320 were killed and 390, injured. This accident led to the development of safer munitions and improved safety during loading operations. (History.com, 2009)

*The Bien Hoa Disaster* - in 1965 an accidental detonation of a bomb loaded on a parked B-57 started a chain reaction of explosions and fires that killed 28 Americans, 6 Vietnamese and wounded 100 more; 10 B-57s were destroyed along with 28 additional aircraft. This accident led to the development of improved aircraft spacing and airfield layout criteria. (Wikipedia.com, n.d.)

Accidents that have occurred in all phases of the munitions lifecycle from production operations through demilitarization, destruction and munitions responses, continue to shape U.S. explosives safety criteria. Additionally, hundreds of U.S. and international tests have been conducted over the last 70 years to further refine explosives safety criteria and attempt to keep pace with more modern and lethal weapons development. Conventional explosives safety also benefitted tremendously from the nuclear testing era, and continues to develop although large scale testing (on the order of typical magazine rating capacities of 500K pounds) in the U.S. has, for the most part, become a thing of the past.

# Status of the U.S. DoD Munitions Safety Program – Program Management Pillars

The DDESB and various forerunners going back to its formative days in the wake of the Lake Denmark Explosion, focused on compliance based inspections at the installation level, the results of which were provided to the Services for action. As the number of installations handling explosives increased from a few dozen to hundreds, and the Services developed mature explosives safety organizations, the role of the DDESB has become that of programmatic oversight. Currently, each of the Services has compliance programs that fill the role previously held by the DDESB compliance “surveys.” The ever-evolving nature of DoD operations (such as the Cold War, Operation Desert Storm, the Global War on Terrorism, Operations Enduring and Iraqi Freedom)<sup>i</sup> as well as the pressures faced due to aging infrastructure and calls for efficiency through consolidation make explosives safety a dynamic and difficult problem set. The role of DDESB oversight has expanded well beyond the conditions of storage to the entire complex munitions lifecycle, along with oversight of intermixed commercial energetics and explosives (such as commercial space launch). The determination of when munitions are considered DoD munitions, as with foreign military sales, can obfuscate explosives safety oversight.

## Current Pressures

The installations and bases used by the Services to conduct munitions-related functions face constant pressure from competing concerns. This is especially acute at the waterfront where explosives arcs from ammunition ports and weapons stations include land that is highly desirable from a development perspective. Community soccer fields, beachfront recreation, and property development are constantly revisited for some of DoD’s current ammunition logistics bases, even while several serious deviations from current DoD minimum standards already exist. High rise condominium development (vulnerable construction from the perspective of glass and progressive collapse considerations) is never advisable at the edge of inhabited building distance (IBD).

Efforts to consolidate functions to reduce operating costs or production time run contrary to a basic tenant of explosives safety – great distances are required for safety from even small explosions. As we look to bring efficiency and cost savings into installations, consideration must be given to the accidents mentioned above and hundreds of others that demonstrate no practical distance is truly safe from accidental explosions. Explosives safety distances developed to support U.S. military operations are minimum distances, aimed to prevent mass casualties and catastrophic loss; greater distances should be applied and maintained when available.

The U.S. Military has evolved towards larger, more complex weapons systems that require specialized storage and complex maintenance requirements. At the same time, there are still large inventories of older systems with more traditional, high explosive (HE) fills. The true hazards posed by newer insensitive fills in large-scale storage have not been well defined due to limited scale hazard classification testing. It is not clear when the DoD will be able to progress to more dense storage schemes and away from those developed in the 1940s and 50s that require large amounts of buffer real-estate. As munitions development progresses towards insensitive items that have a burning reaction in accidental scenarios, earth-covered magazines make less sense as increased confinement can lead to explosions versus the venting afforded by light construction. Small doors on old magazines make storage of very expensive missile systems difficult and often operationally hazardous, and potentially an expensive prospect if these systems are damaged. A vast infrastructure of WWII-era storage (built to the criteria of the day) represents a significant recapitalization cost for the military.

The U.S. munitions enterprise has become increasingly commercial. Hundreds of contractor-owned, contractor-operated (COCO) installations currently support U.S. munitions production. After a long period of contraction, there a few but steady number of government-owned, contractor-operated (GOCO) production installations, albeit with a complex and inconsistent approach to managing risks between contractors and the government. There is a large contractor presence on DoD installations that involves everything from commercial fireworks production,

---

<sup>i</sup> Not intended to be an all-inclusive list. It is important to note that these operations represent important shifts in the way DoD does business. Commensurate shifts in infrastructure to support weapons systems and platforms do not occur, sometimes for several decades. DoD still relies heavily on “Smokeless Powder Magazines” constructed during WWII to store modern munitions. Suitable replacements exist, but prioritization of munitions storage infrastructure is often low.

# Status of the U.S. DoD Munitions Safety Program – Program Management Pillars

storage of commercial blasting materials, and public-private power projects to commercial space launch, all potentially within the explosives arcs of DoD munitions.

All of this is managed at the frontline by Service explosives safety personnel. Given the complexity of DoD installations, operations and safety requirements, we demand that these personnel be expert geographic information systems (GIS) operators, map makers, public liaisons for appropriate land use and development, and the commander's expert advisor on all risks explosive in nature, with some installations responsible for the safe storage of millions of pounds of military explosives. These complex demands afford explosives safety personnel less time in the field to oversee activities and prevent mishaps. Often explosives safety staffing is sacrificed in budgetary decisions. It is unclear across DoD how many explosives safety personnel are required and what metrics should be used to base that requirement. Should they be military or civilian personnel, a mix? During contingency operations, when does explosives safety begin? Bagram and Kandahar come to mind as contingency locations that have now been in place for 17 years. Having military, as well as civilian expertise in explosives safety seems to be the right answer, but in what proportion?

Base realignments, consolidation efforts, Joint Basing, and increased tenant and inter-agency use make the role of explosives safety personnel even more complex. Explosives safety personnel become involved when local communities want to use land within IBD arcs. Giving land for parks and recreational use – what personnel densities are too high for this, and is this an appropriate use of buffer zones? Explosives safety personnel stand in the breach, often faced with telling the commander that this “great idea” for improving relations with the surrounding community is not so great indeed.

The role of the explosives safety professional is diverse, difficult and demanding, especially at complex, joint and multi-national locations. The roles of respective headquarters, explosives safety centers and DoD should be to develop clear, interoperable policies and delineate areas of focus from the perspective of best practices and efficient use of resources, in order to reach a balance of operational effectiveness and adequate safety in garrison, on the battlefield and in all the spaces between. The Service's explosives safety professionals are responsible for tens of thousands of yearly shipments by Military Air, commercial trucking and ships bound for storage in the multi-national environment. They are faced with complex unexploded ordnance (UXO)/munitions and explosives of concern (MEC) cleanup projects on installations and in the local community, munitions production and maintenance operations, demilitarization, the storage of strategic stocks and the storage of vintage items for decades awaiting demilitarization. They are responsible for lightning protection systems (LPS) that serve these locations, complex ship loading and off-loading operations, safe resupply of maritime stockpiles, rail operations, combat ship and submarine loading/off loading, and an evolving research, development, test and engineering (RDT&E) landscape with weapons development far outpacing the development of governing safety regulations. The more complex, lethal and mobile the Force becomes, likewise explosives safety becomes increasingly complex and dynamic. The U.S. military has evolved from projectiles and gun powder to a military of precision strike, standoff weapons, guided artillery, insensitive explosive fills and advanced explosives that are not necessarily captured in current criteria. So with all these dynamics changing the munitions landscape around us, what should effective programs include to meet the challenge? Where should Services focus effort?

## **Explosives Safety Program Management Elements**

Based on a decade of Service-level, programmatic focused evaluations, the DDESB Staff has identified the following program management elements for an effective ESMP. These elements will be further developed and used to support future improvements in DoD explosives safety policy.

### Organization and Staffing

Explosives safety organizational lines should be well established and extended to leadership (commander, Component Head or appropriate risk decision authority) to effectively communicate explosives safety program status and risks. If risks are not communicated to commanders, appropriate risk and resource decisions cannot be made. Explosives safety professionals often find getting face-time with a commander to be difficult when in many

# Status of the U.S. DoD Munitions Safety Program – Program Management Pillars

cases the most dangerous and expensive assets on the base are munitions. Command schools should be very candid about this and make incoming commanders acutely aware of the risks munitions pose. Explosives safety organizations need to be appropriately aligned to provide independent and unbiased information on explosives safety risk.

Components need deliberate methods to determine appropriate explosives safety personnel requirements. Once studied, activities then need to be staffed with the proper number of trained explosives safety personnel to oversee the explosives safety functions. Component staffing levels should be tracked at the headquarters level. Headquarters need to serve as an effective advocate for maintaining appropriate staffing levels. Often, explosives safety personnel are some of the first positions to be gapped, and hiring freezes can result in long periods without an appropriate professional on staff. Explosives safety has become such a complex and demanding function that independence from other drivers is key; collateral explosives safety personnel face greater pressure to unnecessarily support waiving requirements. Along with having the appropriate staff, the explosives safety mission needs to be sufficiently funded and resourced – vehicles, IT, training, etc. Explosives safety is a “go out and look” activity that is constantly changing and a key mission enabler when effectively resourced.

## Management of Tenant Activities

DoD Installations are becoming increasingly complex patchworks of activities to include multi-Service, inter-Agency and multinational concerns. Contractor presence and their munitions responsibilities continue to grow. Installations need to properly identify and maintain effective communication with and oversight of tenant munitions-related activities. Components need to conduct periodic inspection or review of installation tenant explosives activities and understand how the activities of multiple tenants pose risk on a given installation. Tenant munitions-related functions need to be under the control of appropriate explosives safety personnel and synchronized with installation operations. Tenant munitions-related functions, explosives facilities and operations require appropriate approval, and need to form an integrated part of the installation’s ESMP. Coordination documents, such as a Memorandum of Agreement (MOA) or Memorandum of Understanding (MOU), need to be kept current, delineate clear relationships with tenants and be readily available to explosives safety staff.

## Contractors

Contractors remain an integral part of DoD’s munitions enterprise. The relationships between contractors and explosives operations poses unique challenges based on the dynamic and changing nature of various support contracts. Contracted, non-explosives operations need to be kept outside IBD unless otherwise permitted (e.g., construction waivers). This can be difficult as contracts are often very transient in nature and not necessarily part of the munitions operation. Contracts, leases or other agreements that involve contracted explosives operations on DoD installations need to have the nature of such support clearly documented, to include specific safety requirements. Components need to maintain effective oversight of contractors performing explosives operations; this can be often viewed as difficult and contrary to the nature of contracting whereby the contractor is typically fully responsible for means and methods – this is not the case for explosives operations. Contracting Officers and safety personnel require a direct and open line of communication and government safety personnel should provide direct oversight of all explosives operations that involve DoD munitions or that occur on DoD installations.

## Deviations and Compensatory Measures

Munitions-related risks need to be clearly identified, quantified, documented, managed and accepted by the appropriate level of leadership. These risks are often ignored or understated as “an explosion has not occurred here in some time.” Risk reducing measures should be clearly identified in standard operating procedures (SOPs) and fully implemented by involved personnel. Installations up through headquarters should maintain records of explosives safety-related deviations. Headquarters must be informed and track deviations in accordance with DoD and Component requirements, not just because it is a requirement but because information of this nature should be

# Status of the U.S. DoD Munitions Safety Program – Program Management Pillars

used to guide infrastructure requirements and major installation programs such as Base Realignment and Closure (BRAC). Consolidation efforts often inadvertently increase explosives safety risks. Distance (i.e., empty tracts of land) forms the basis for explosives safety and asset protection. Development and encroachment can result in serious risk that must be managed for the life of the installation. Deviations need to be actively managed and Components should take measures, when practical, to correct conditions necessitating a deviation. An accurate accounting of risk information is required to make sound facility investment decisions. Reducing risk should be part of the master planning program and part of the calculus that is used to make funding decisions.

## Site Planning

Within the U.S. DoD, all explosives operations facilities or non-explosives facilities that are located within IBD arcs require properly developed and approved site plans. DoD operations occurring on non-DoD installations (multi-national, contractor facilities) also require an approved site plan in accordance with regulations. Components need a site planning process that is clearly defined across the organization. Each activity should understand what is required by their approved site plan as well as what to do when changes to the mission dictate a change in siting. DoD site plan approvals must be maintained and understood at the activity and installation level. An approved site plan should form the basis for SOP development, and operating procedures (to include compensatory measures) need to be implemented and correctly executed. Procedures need to be established to facilitate ready access to, and updating of, site plans. Such a process is required to support the dynamic nature of DoD operations. Accurate records of current and cancelled site plans should be maintained; often historical approvals contain information that forms the basis for new approvals.

DoD and the Services have invested tremendous effort in automated site planning (ASP), recognizing both the complexity of the site planning process and the need for more dynamic planning capability given the ever-changing interrelation between munitions, weapons systems, Force structure and facilities. ASP provides a powerful tool to support this dynamic relationship by removing the complexity of analysis involved in changing siting to support mission, and allowing safety to “keep up” with the force. Automated site planning needs to be used when possible, and pays tremendous dividends in terms of the time required to create a site plan as well as site plan accuracy when the datasets supporting ASP are adequately maintained. Explosives safety personnel are typically not surveyors or GIS experts and need the support of their installation and headquarters to ensure accurate installation maps are maintained in a format usable by explosives safety personnel. An observed best practice in this area is to have base master planners keep and operate the ASP tool and use their respective explosives safety personnel as advisors when changes are required. This keeps the mapping in the hands of the mapping professionals and frees explosives safety personnel to spend more time preventing mishaps. It also fosters a sound relationship between master planners and explosives safety personnel.

## Master Planning

Consequence mitigation in explosives safety is primarily based on maintaining adequate separation between explosives-related facilities and the conventional facilities that surround them, both on and off base. In order for explosives safety personnel to build relationships with master planners, Services should identify, in writing, the master planner (or equivalent) responsible for maintaining explosives safety quantity-distance (ESQD) arcs in master planning documents/databases for each installation. As mentioned previously, placing the ASP tool in the hands of master planning personnel is an effective way to ensure this is done. A master planning review process, including explosives safety review, should be incorporated into development planning for the base, and explosives safety should be a large part of the facility funding decision-making process.

# Status of the U.S. DoD Munitions Safety Program – Program Management Pillars

## Accident Prevention Program

Explosives safety personnel, as well as those involved in explosives operations should be dedicated to accident prevention. Mishaps involving explosives need to be evaluated to determine root causes and identification of preventive measures. This responsibility extends from DoD through the Services and down to the installations. As previously mentioned, much of modern explosives safety criteria was developed from accident data and all explosives safety personnel should understand its lineage. Root cause determination is vital to understanding the conditions that led to an accident, and root cause analysis should be used to select appropriate preventive measures for implementation. Accidents should be documented by the explosives safety office, should be reported properly and, as much information as feasible, should be quickly disseminated.

## Explosives Safety Issuances

The appropriate and timely flow of this information is a vital part of the explosives safety program. From headquarters down to individual activities, explosives safety policies and operating procedures need to be up to date and in agreement with site plan approvals. These policies need to be enforced along with other local policies, such as compensatory measures, which should be identified and documented in operating procedures. Detailed hazard analyses should be conducted and documented in support of operating procedures. This may require identifying appropriate subject matter experts to support the analyses. Often overlooked, specialized areas, such as Hazards of Electromagnetic Radiation to Ordnance (HERO), should be identified and mitigated by personnel with appropriate expertise.

## Facilities Conformance and Maintenance

Facilities (to include something as small as a pad or a portable magazine to something as large as a runway or manufacturing plant) must adhere to approved site plans and explosives safety requirements. Munitions storage and compatibility, housekeeping, vegetation control, structural condition, glazing, and LPS all need to be maintained in accordance with regulations. While from a compliance perspective, the explosives safety personnel will often bear the ire of violations in this area, the facilities process as a whole needs to support compliance. Planning, construction, facility and installation maintenance need to be funded, and explosives safety-related requirements given adequate priority as part of the public works/civil engineering process. Munitions-related facilities require well documented inspection and maintenance programs that are coordinated with explosives safety personnel.

## Ranges

While the Services often use other, Service-specific criteria to support ranges, the Board has adopted Range approval requirements for specific applications. Ranges need to be used for their approved operations. The dynamic nature of the military training requirements sometimes outpaces adequate range planning. Range boundaries need to be clearly defined, and surface danger zones (SDZs) marked and understood by personnel using or near the range. Access to the range needs to be controlled. Specially designated ranges addressed in DoD criteria, such as Explosive Ordnance Disposal (EOD) proficiency training ranges, need to be constructed and used in strict accordance with site approvals.

## Demilitarization and Destruction

The proper handling of items determined to be material potentially presenting an explosives hazard (MPPEH) is vital to ensure hazardous items or materials do not make their way into the recycling stream or to the public. Demilitarization and destruction operations must be conducted in accordance with site approvals. MPPEH must be treated in accordance with regulations and treated as explosives until properly certified and verified as material documented as safe (MDAS). A brass recycling program, when required, must be documented and conducted in

# Status of the U.S. DoD Munitions Safety Program – Program Management Pillars

accordance with regulations. A process for assuring that MPPEH, material documented as an explosive hazard (MDEH) and MDAS are not comingled must be documented and followed (chain of custody, etc.).

## Records Management

Explosives safety-related records must be maintained and managed correctly. Net Explosive Weight (NEW), Hazard Division (HD) and compatibility requirements must be managed in accordance with approved site plans or licenses and regulations. ESQD data must be consistent among all relative installation documents and records. Inventory management systems must be able to accurately track NEW, HD, Maximum Credible Event (MCE) and parenthetical (xx) limits, and compatibility. Inventory managers must have access to the Joint Hazard Classification System (JHCS) or Component hazard classification data to ensure proper assignment of AE present. Local and in-process hazard classification determinations must be documented and maintained.

## Emergency Response

Emergency response personnel, equipment and facilities must be in place to support the explosive safety mission. Personnel must be adequately trained for emergencies, and training must be documented and monitored. Quantity and HD of material and operational information (e.g., type of operation, potential hazards, transportation of AE) must be communicated to emergency response personnel, and they must be able to identify appropriate withdrawal distances. Disaster preparedness/emergency response plans must be developed. Fire Department cooperative agreements must be clear; and other (non-DoD) firefighters must be properly trained for AE hazards that may be encountered. EOD units that support a location must be identified and/or mechanisms to request EOD support must be documented and understood.

## Inspections, Evaluations, Audits and Surveillance

An effective Component explosives safety oversight program includes internal (self) and external inspection, evaluation, audit and surveillance efforts, where the results of these efforts are documented, analyzed, distributed, tracked, and incorporated into action plans and lessons learned. Action plans must be developed, assigned and tracked to remediate inspection findings/deficiencies. Inspection, evaluation, and audit results should also be analyzed to identify opportunities for explosives safety policy improvements, as well as to confirm program effectiveness.

## **Conclusions**

Explosives safety and munitions risk management across the entire munitions lifecycle and through the full spectrum of military operations is a critical mission enabler. The DoD has a responsibility to protect the public, personnel and mission assets from the potential hazards posed by military munitions as well as from other explosives that may be located on DoD installations (commercial, inter-Agency, multi-National). The current DoD munitions inventory is composed of both state-of-art, complex systems with modern, insensitive fills as well as more traditional HE-filled artillery and propellants. Explosives safety requirements have a complex lineage and play an important role in everything from planning a family housing project to tactical base camp development. The explosives safety professional is responsible for a broad problem set from mapping and master planning to mishap prevention. The program management elements included here are intended to help form the basis of a sound Component program and to help better address this complex and dynamic problem set.

# Status of the U.S. DoD Munitions Safety Program – Program Management Pillars

## References

History.com. (2009). *1944 Port Chicago Disaster*. (A+E Networks) Retrieved June 6, 2018, from History.com:  
<https://www.history.com/this-day-in-history/port-chicago-disaster>

History.com. (2010). *The Great Halifax Explosion*. (A+E Networks) Retrieved June 6, 2018, from  
<https://www.history.com/this-day-in-history/the-great-halifax-explosion>

Wikipedia.com. (n.d.). *Bien Hoa Air Base*. Retrieved June 6, 2018, from  
[https://en.wikipedia.org/wiki/Bien\\_Hoa\\_Air\\_Base#1965\\_Bien\\_Hoa\\_Disaster](https://en.wikipedia.org/wiki/Bien_Hoa_Air_Base#1965_Bien_Hoa_Disaster)