

A Study on Comparative Analysis of Maritime Security Programs – Focussed on TWIC

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Abstract : To improve maritime security and enhance international shipping commerce within US ports in addition to ISPS (International Ship and Port Facility Security Code), the TWIC (Transportation Worker Identification Credential) program is working on the maritime field from the October 15, 2008 in the United States. In this paper, the program is reviewed and investigated in terms of goal, benefit, solution, and related legislation so forth. In addition, other maritime security programs including MMD (Merchant Mariner Document), FAST (Free and Secure Trade), SIDA (Security Identification Display Areas). and Air Cargo security program was analyzed and compared in order to obtain relationship and difference with the program in terms of enrollment frequency, list and method of security check, and profile of each program. As a result of this paper, the program is mostly to improve maritime security, protect individual privacy, and enhance commerce rather than other programs.

Key words : Maritime, Security, TWIC, Port, MMD, FAST

1. Introduction

The United States (U.S.) Coast Guard and the Transportation Security Administration announced that April, 2009, is the Transportation Worker Identification Credential compliance date for owners and operators of facilities located within the U.S. Coast Guard Captain of the Port Zones of Houston-Galveston, Texas, Los Angeles-Long Beach, Calif., San Juan, Puerto Rico and Guam (USCG, 2009). The primary goal of the TWIC (Transportation Worker Identification Credential) program is to develop a nationwide transportation identity solution that verifies the identity of transportation workers, evaluates their security information to determine whether they may qualify for unescorted access to secure areas, and assists transportation facilities and vessels with controlling access to their secure areas. (Moss, 2008) Additional benefits of the program include reducing the duplication of credential efforts and establish uniform and consistent standards for identity management for all transportation modes. Therefore, this study is focused on this program including compliance date, benefits, goal, solutions, related legislation. In order to identify relationship and development of programs with security check requirements similar to those for the hazardous materials endorsement program, this research is examined most recent programs' security check requirements and held discussions with Transportation Security Administration (TSA), Coast Guard, Customs and Border Protection (CBP), and Screening and Coordination Office (SCO) officials. There are previous four programs in US Port governed by TSA, CBP, and SCO for

safety and security check of international shipping. Merchant Mariner Document (MMD) which is required for mariners who serve on merchant vessels of at least 100 gross tons and serves as a qualification and identity document, specifying each rating for which the holder is qualified. Free and Secure Trade (FAST) which is a voluntary program for commercial drivers as part of a border accord Initiative between the United States, Mexico, and Canada to allow known low-risk participants to receive expedited border processing. Security Identification Display Areas (SIDA) which is a security threat assessment for aviation workers who hold airport badges and have unescorted access to airport secure areas. Air Cargo which is requires a security threat assessment for individuals with unescorted access to air cargo who are employees or agents of certain aircraft operators, foreign air carriers, or indirect air carriers.(DHS, 2008) Therefore, these maritime security programs are reviewed and analyzed the relationship and difference comparing with the TWIC.

2. Transportation Worker Identification Credential (TWIC)

2.1 Definition of TWIC

The TWIC is a common identification credential for all transportation workers and personnel requiring unescorted access to secure areas of Maritime Transportation Security Act of 2002 (MTSA) -regulated facilities and vessels, and all mariners holding Coast Guard-issued credentials. Individuals

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who meet TWIC eligibility requirements will be issued a tamper-resistant credential containing the worker's biometric (fingerprint template) to allow for a positive link between the card and the individual. (Gina, 2008) TSA will issue workers a tamper-resistant "Smart Card" containing the worker's biometric including fingerprint template to allow for a positive link between the card itself and the individual (TSA, 2009).

2.2 Compliance Date of a TWIC

Transportation personnel and workers will be required to possess a TWIC by the compliance date set for their specific Captain of the Port (COTP) zone. Below is the latest schedule for COTP zone compliance. All compliance announcements will be made in the Federal Register at least 90 days in advance.

Table 1 Compliance date and COTP zones

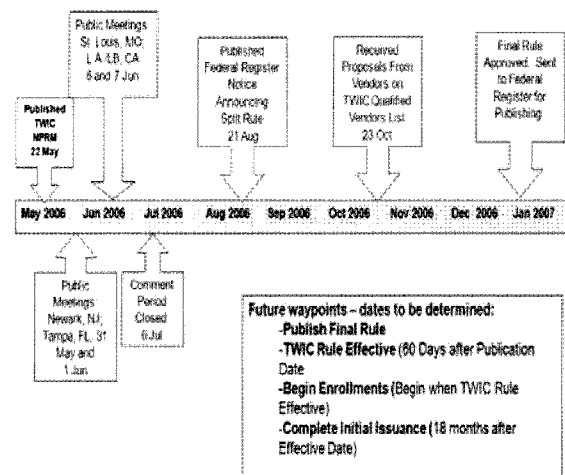
Date*	COTP Zones*
October 15, 2008*	Northern New England, Boston, Southeastern New England*
October 31, 2008*	Buffalo, Duluth, Detroit, Lake Michigan, Sault Ste. Marie*
November 26, 2008*	Corpus Christi, Port Arthur, North Carolina, Cape Fear River*
December 01, 2008*	Long Island Sound, Charleston, Savannah, Jacksonville*
December 30, 2008*	Baltimore, Delaware Bay, Mobile, Pittsburgh, Ohio Valley, Lower Mississippi River, San Diego*
January 13, 2009*	Hampton Roads, Morgan City, New Orleans, Upper Mississippi River, Miami, Key West, St. Petersburg*
February 2009*	Honolulu, South East Alaska, Prince William Sound, Western Alaska, Puget Sound, Portland (OR), San Francisco Bay*
March - April 2009*	New York, Guam, Houston, Galveston, Los Angeles Long Beach, San Juan*

Source: Transportation Security Administration*

2.3 TWIC Goal and Solutions

Security force and equipment are not established on commercial ships and ports. Maritime employers and seafarers have not been trained and educated to have security culture except safety culture. (Lee, 2005) TWIC will satisfy the domestic credential requirements of the Maritime Transportation Security Act of 2002 (MTSA), and significantly improve security on U.S. vessels and within U.S. ports. The program has goal and solutions in terms of enhance security, facilitate commerce, and protect personal privacy. For more detail, it is described individually as follows. In terms of enhance security, program must enhance security sufficiently to justify cost and effort to implement. As the solution, the program establishes a "chain-of-trust" architecture to - Verify identity - Complete threat assessment on that identity - Authenticate identity at access points. Program must provide the opportunity to

efficiently and quickly determine who is eligible for access to secure areas in the side of facilitate commerce. As the solution, Program provides common credential - Eliminate redundant background checks - Provide biometric credential interoperable with wide variety of systems - Embed biometric in credential to avoid need for IT connectivity to central database. Transportation Worker Identification Credential (TWIC) which is a tamper-resistant biometric credential for credentialed merchant mariners and personnel requiring unescorted access to secure areas at maritime facilities and vessels is to obtain and improve security by establishing a system-wide common credential for personnel requiring unescorted physical and/or logical access to secure areas of the transportation system and manage identity of individuals requiring unescorted access to secure areas by positively verifying identity, performing appropriate security threat assessment, denying access to unauthorized individuals, and revoking access immediately upon loss of eligibility (John, 2006). The regulation will seek to achieve the security benefits that Congress expected when the MTSA was enacted without imposing unnecessary burdens on the regulated community. Comment is sought on the impacts and processes involved in a future TWIC program.



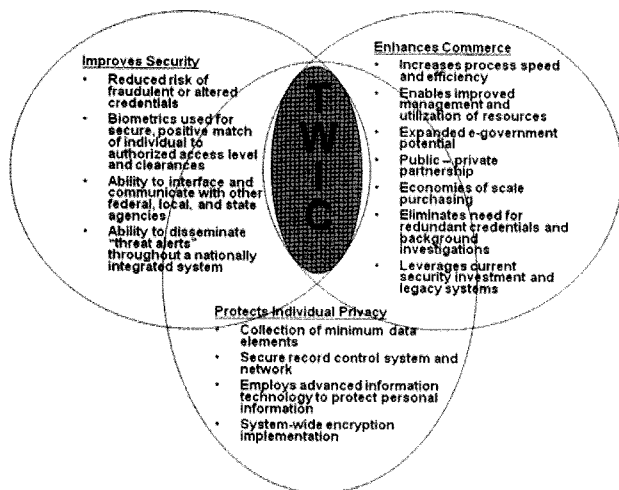
Source: Department of Homeland Security and USCG

Fig. 1 TWIC timeline

2.4 TWIC Program Benefits

TWIC creates a tamperproof ID credential that may be used and accepted across all modes of the transportation system, creates a uniform, national standard for secure identification of transportation workers, reduces redundant credentials and security checks, provides a solution to positively and securely link an individual to a credential via biometrics and to the security information of that individual,

ensures compatibility with existing facility access control systems to leverage current security investments, and provides ability to revoke access privileges to TWIC holders who are identified as a threat. The program is consistent with principles of Homeland Security Presidential Directive 12 (HSPD 12) and the Federal Information Processing Standards (FIPS) 201. FIPS 201 raises the Federal Standard for identity management business practices throughout the Federal Government, making the TWIC a trusted and universal ID card.



Source: TWIC and Transportation Security Administration⁶

Fig. 2 Benefits of TWIC

3. Related Legislation

There are three legislation related including USA PATRIOT Act of 2001, Aviation and Transportation Security Act of 2001 (ATSA), and Maritime Transportation Security Act of 2002 (MTSA). USA PATRIOT Act of 2001 requires states to conduct security checks through the Attorney General and TSA before issuing licenses to individuals to transport hazardous materials in commerce. Aviation and Transportation

Security Act of 2001 (ATSA) grants the TSA Administrator broad authority for transportation security and requires TSA to ensure the adequacy of security measures at airports; directs strengthened access control points in airport secured areas; and, requires TSA to consider the use of biometric, or similar technologies, to identify individuals employed at airports.(Lisa, 2004) Maritime Transportation Security Act of 2002 (MTSA) requires the issuance of biometric transportation security cards and the completion of security checks for entry to any secure area of a vessel or facility.

3.1 SAFE Act's Requirement

The SAFE Port Act contained a requirement for implementing the first major phase of the TWIC program by 2007.(SAFE, 2003) The Act required TSA to implement TWIC at the 10 highest risk ports by July 1, 2007, conduct a pilot program to test TWIC access control technologies in the maritime environment, issue regulations requiring TWIC card readers based on the findings of the pilot, and periodically report to Congress on the status of the program. TSA is taking steps to address these requirements, such as establishing a rollout schedule for enrolling workers and issuing TWIC cards at ports and conducting a pilot program to test TWIC access control technologies. As TSA begins enrolling workers and issuing TWIC cards this year, it is important that the agency establish clear and reasonable time frames for implementing TWIC. Further, TSA could face additional challenges as the TWIC implementation progresses. These challenges include monitoring the effectiveness of contract planning and oversight, ensuring a successful enrollment process, and addressing access control technologies.

3.2 Scanning and Verification at Facilities - 33 Code of Federal Regulation (CFR) 105

The Coast Guard proposed rule includes several new requirements related to access control that could have a significant impact on a facility's efficiency and costs. The proposed rule requires all MTSA-covered maritime facilities to have: 1) biometric readers to complete a 1-to-1 biometric match (33 CFR 105.200 and .255), 2) an ability to verify the TWIC card against TSA's database (33 CFR 105.255), 3) knowledge of who is on the facility at all times (33 CFR 105.225), and 4) an ability to enter a Personal Identification Number (PIN) (33 CFR 105.255).

3.3 Impact on Port Workers and Visitors and the Importance of Maintaining and Adequate Workforce - 33 CFR 101. 1005; 105.255

While the TWIC will be helpful to many facilities in fighting terrorist risks, the rule as drafted has several omissions that could significantly impact port operations related to the work force and normal business operations. The TWIC system must allow efficient movement of port workers, and be flexible enough to accommodate a variable workforce and visitors. Many port operations rely on a temporary workforce to help unload a ship, and these "casual" laborers are given visitor or temporary passes to

allow access. This size of this casual labor force can be significant, and AAPA is concerned about their omission in the rule and questions how much consideration TSA gave to these workers.

3.4 Issuance of the TWIC Card - 49 CFR 1572

The TSA proposed regulations in 49 CFR 1572 outline rules requirements related to credential and security threat assessments. As noted above, AAPA is generally supportive of the issuance of the card and urges TSA to move quickly to begin the issuance process. AAPA is also recommending additional review and evaluation by TSA on the following issues related to 49 CFR1572 or sections otherwise noted.

3.5 Shared Enforcement - 49 CFR 1572.4

AAPA is worried about the provisions in the proposed rule that allow TSA to have access to port facilities to check on TWIC implementation. The MTSA clearly gives the U.S. Coast Guard the lead on all facility requirements and that should include facility compliance with TWIC, since this is an access control requirement. Having two different federal agencies in charge of facility security will result in inconsistent enforcement and interpretation. TSA should be in charge of card issuance, and the Coast Guard should enforce the TWIC requirements within a facility. If TSA needs access to card readers, this should be done under the oversight of the Coast Guard.

3.6 Impact on Smaller and Lower Risk Facilities - 33 CFR 105

The proposed rules will have significant impact on lower-risk and smaller facilities, with little decrease in risk. AAPA urges DHS to closely evaluate the access control and escorting requirements and their impact on smaller, lower-risk facilities.

4. Comparison Between TWIC and Other Security Programs

4.1 Various Implementation Factors

There are various implementing factors including population, commercial vessels, tug boats and barges, cruise ships, IT and infrastructure, unique business processes and security requirements, facility, vessel types, and environmental conditions. For more detail, possible components is described in Table 2.

Table 2 Implementing Factors

Implementing Factors	Possible Components
Population	Port workers, Truck drivers, Longshoremen, U.S. merchant mariners, and Vessel crew members, Commercial vessels, Passenger vessels, Tug boats and barges, Cruise ships, Rail workers, Maintenance workers.
It and Infrastructure	
Unique Business Processes and Security Requirements	
Facility/Vessel Types	Port facilities, Vessels, Open ocean, Rivers, Lakes, Outer Continental Shelf facilities,
Environmental Conditions	Temperature, Humidity, Sunlight, Dirt, Rain, Snow, Spray.

4.2 Comparison with Other Security Programs

In order to identify programs with security check requirements, it is better to examine various programs' security check requirements by Transportation Security Administration (TSA), Coast Guard, Customs and Border Protection (CBP), and Screening and Coordination Office (SCO) officials. Transportation Worker Identification Credential (TWIC) compare with other security programs including the following four programs:

- Merchant Mariner Document (MMD) - The Merchant Mariner's Document (MMD), previously called a Z-Card, is a kind of Merchant Mariner Credential issued by the United States Coast Guard in accordance with the STCW guidelines, and is the standard documentation required for all crew members of U.S. ships with a Gross Register Tonnage of over 100. An entry-level MMD allows one to work on the deck as an Ordinary Seaman (OS), in the engine department as a Wiper, or in the steward's department as a Food Handler (FH). With experience and testing, qualified ratings such as Able Seaman (AB) or Qualified Member of the Engine Department (QMED) can be obtained.

- Free and Secure Trade (FAST) -The Free and Secure Trade (FAST) program is a Border Accord Initiative between the United States, Mexico, and Canada designed to ensure security and safety while enhancing the economic prosperity of each country. In developing this program, Mexico, Canada and the United States have agreed to coordinate, to the maximum extent possible, their commercial processes for clearance of commercial shipments at the

border. This will promote free and secure trade by using common risk-management principles, supply chain security, industry partnership, and advanced technology to improve the efficiency of screening and clearing commercial traffic at our shared borders.

- Security Identification Display Areas (SIDA) – a security threat assessment for aviation workers who hold airport badges and have unescorted access to airport secure areas. (Ahlstrom, 2006) it is a special security area designated by an airport operator in the US to comply with Federal Aviation Administration (FAA) requirements directed by Federal Aviation Regulation (FAR) part 107.205. An identification system must be used in this area. Before allowing unescorted access to this area, a person must be trained and their background investigated. Normally, the flight ramp and other sensitive operational areas of a US commercial airport are designated as a SIDA.

- Air Cargo – requires a security threat assessment for individuals with unescorted access to air cargo who are employees or agents of certain aircraft operators, foreign air carriers, or indirect air carriers.

Those comparisons are described as below tables, 3,4, and 5.

Table 3 Contents and checks

Program ¹	Enrollment frequency ²	What's checked ³ (A) criminal offenses, (B) immigration status, (C) mental capacity, (D) access to terrorism, (E) drug use ⁴	How checked ⁵ (1) fingerprint-based criminal history check, (2) name-based, biographic check ⁶ , (3) drug test, (4) national driver registry, (5) interview ⁷
TWIC ⁸	5 years ⁹	A, B, C, D ¹⁰	1, 2 ¹¹
MMD ¹²	5 years ⁹	A, B, C, D, E ¹⁰	1, 2, 3, 4 ¹¹
FAST ¹³	5 years ⁹	A, B, D ¹⁰	1, 2, 5 ¹¹
SIDA ¹⁴	Once, if ¹⁵ continuously employed ¹⁶	A, B, D ¹⁰	1, 2 ¹¹
Air Cargo ¹⁷	Once, if ¹⁵ continuously employed ¹⁶	B, D ¹⁰	2 ¹¹

Source: Department of Homeland Security¹⁸

TSA checks a list of all individuals who have completed a TSA background check against databases that are updated regularly. As results of comparisons including enrollment frequency, contents and method of checking among MMD, FAST, SIDA, Air cargo and TWIC, every 5 years are required for MMD, FAST, and TWIC. However, just one time is needed for SIDA and Air cargo if continuously employed. In addition, MMD checked criminal offenses, immigration status, mental capacity, terrorism and drug use. However, both SIDA and FAST checked criminal offenses, immigration status and terrorism.

Table 4 Profile of each program

Program ¹	Agent ²	Sector ³	Number of Enrollment Centers ⁴	Number of Workers ⁵	Cost to Applicant ⁶
TWIC ⁸	TSA ⁹	All except aviation ¹⁰	130 ¹¹	750,000 ¹²	\$105.25 ¹³ - \$137.25 ¹⁴
MMD ¹⁵	Coast Guard ¹⁶	Maritime ¹⁷	17 ¹⁸	210,000 ¹⁹	\$45 - \$140 ^{20,21}
FAST ²²	CBP ²³	Trucking ²⁴	17 ²⁵	78,862 ²⁶	\$50 ²⁷
SIDA ²⁸	TSA ⁹	Aviation, Trucking ^{29,30}	Not Applicable ³¹	2 million ³²	\$29 ³³
Air Cargo ³⁴	TSA ⁹	Aviation, Trucking ³⁵	Not Applicable ³¹	51,625 ³⁶	\$28 ³⁷

Source: Department of Homeland Security³⁸

¹16 states manage the collection of HME background information³⁹

²Enrollment is conducted by airport, aircraft operator, or air carrier⁴⁰

³Airport and aircraft operators may charge additional fees⁴¹

⁴The number of truck drivers that apply for a SIDA is limited and does not occur often, according to TSA⁴²

⁵The Coast Guard does not charge a fee for the background check. MMD cost to applicant includes evaluation of medical fitness and professional qualifications⁴³

On the comparisons including agent, sector, number of enrollment centers, number of workers, and cost to applicant among MMD, FAST, SIDA, Air cargo and TWIC, Transportation Security Administration (TSA) is taking charge of TWIC, SIDA, and Air Cargo. Sector of each program is all area except aviation for TWIC, maritime area for MMD, trucking for FAST, aviation and trucking for SIDA, and aviation and trucking for Air cargo. Especially, cost to applicant for MMD is that the Coast Guard does not charge a fee for the background check. MMD cost to applicant includes evaluation of medical fitness and professional qualifications.

Table 5 Other programs that meet program requirements.

Program ¹	Other Programs That Meet Program Requirements ²
TWIC ³	FAST, or MMD or Merchant Mariner License (issued during certain periods) ⁴
MMD ⁵	None ⁶
FAST ⁷	None ⁶
SIDA ⁸	None ⁶
Air Cargo ⁹	SIDA, TWIC, FAST ¹⁰

Source: Department of Homeland Security¹¹

As results of comparisons for other programs that meet program requirements among MMD, FAST, SIDA, Air cargo and TWIC, other programs that meet program requirements for TWIC are FAST, MMD, Merchant mariner license. However, SIDA, TWIC, and FAST met program requirement of Air cargo.

5. Conclusion

This paper is analyzed the TWIC's goal and solution, benefits, and related legislations. Furthermore, based on the analysis, comparisons with other security programs including MMD, FAST, SIDA, Air cargo and TWIC was conducted. As results of the comparisons, MMD checked criminal offences, immigration status, mental capacity, terrorism and drug use. However, both SIDA and FAST checked criminal offenses, immigration status and terrorism. other programs that meet program requirements for TWIC are FAST, MMD, Merchant mariner license. However, SIDA, TWIC, and FAST met program requirement of Air cargo. Finally, it is analyzed that the TWIC program is mostly to improve maritime security, protect individual privacy, and enhance commerce rather than other programs in future. In order to deal with the program, all workers and personnels who work and enter the restricted and secured area need to be trained and took education and program. In doing so, the program needs to be reviewed its activities in future as well.

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