

2D Barcodes & Biometrics:

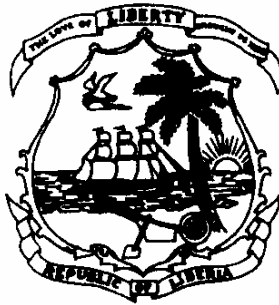
The Secure Combination on Seafarer ID Cards

Charles Lynch

***Vice President, Sales & Marketing
Datastrip, Inc.***

Stephen Frey

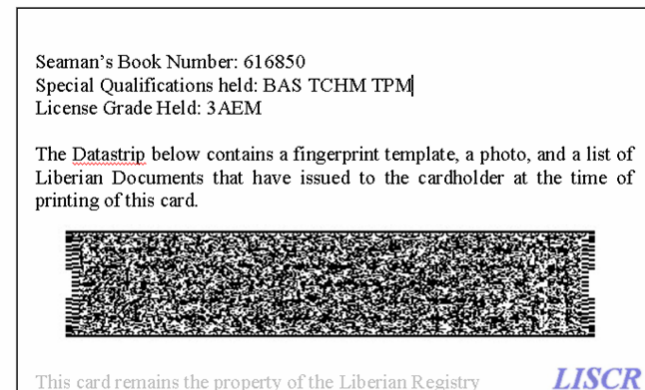
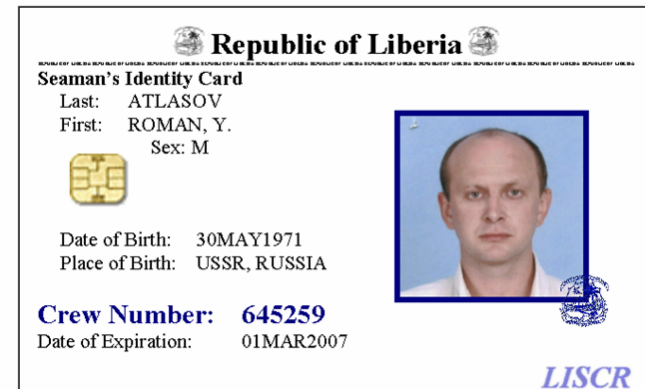
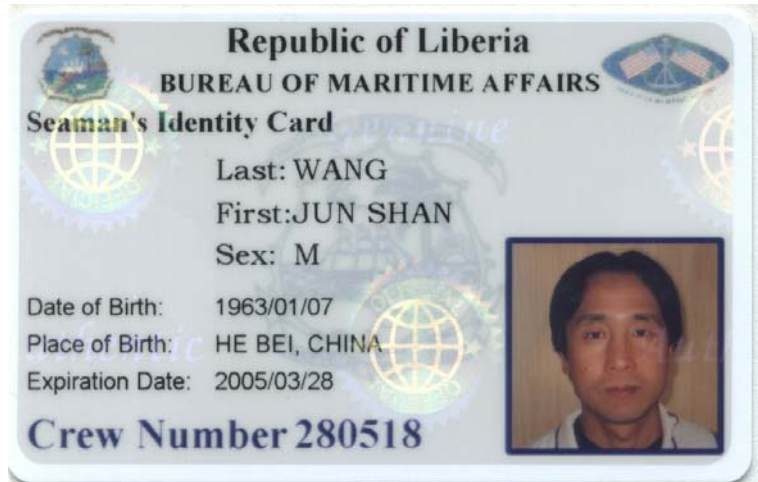
***Assistant Department Head, Seafarer Documentation
The Liberian Registry***



Project Overview

- DS 2D bar code used for world's first biometric seafarer ID card by world's second largest shipping registry;
- Liberian Registry: HQ in Vienna, VA, 500K active seafarers, 2,000 vessels in fleet;
- Purpose:
 - **Improve Maritime Security by issuing low cost secure document with embedded biometric template for objective identity verification of cardholder**

Actual Card Design





Why a 2D Bar Code?

.....*Durability*.....

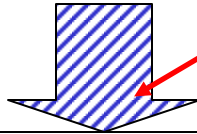
Immune to electrical or magnetic interference



Aggressive error correction:
2DSuperscript is fault
tolerant with up to 50% error
correction from destruction.

.....Encryption...

Maria Smith
123 Main Street
Anywhere, Country 12345



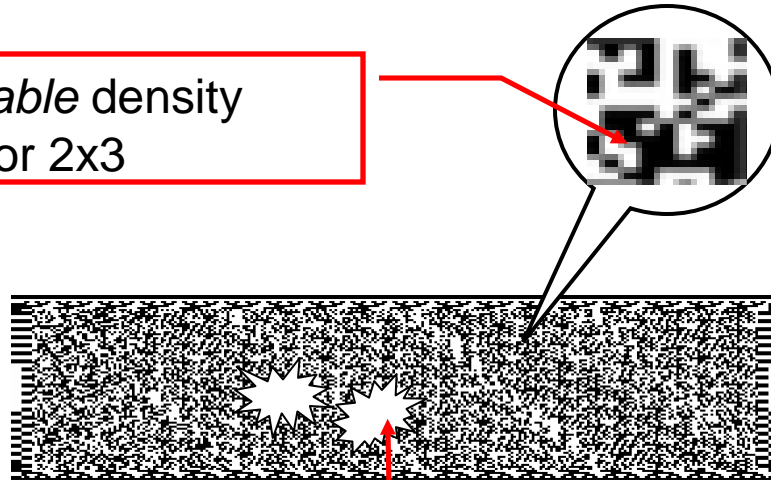
mrNtrskljdoahd
Klsui37 shyr Syht
kkljasG?he8
ka7jqD=ksyeS

The data can be encrypted before the generation of the 2DSuperscript, resulting in FLEXIBILITY and a higher level of PRIVACY. Supports virtually any method of encryption



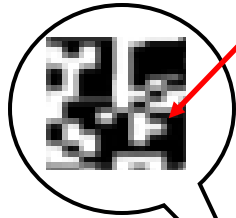
.....*Flexibility*.....

Variable density
2x2 or 2x3



Variable error correction: The fault tolerance level of 2DSuperscript is adjustable from 25% to 50%.

.....*Security.*



2DSuperscript cannot be altered without rendering the encoded information useless



Optionally the 2DSuperscript can be built unique to LISCR's system. Also the entire bar code or portions of the data inside can be encrypted prior to generation

Verification Equipment



DSVerify2D

- Hitachi SH4 processor;
- Win CE operating system;
- 1:1 fingerprint verification;
- High-resolution color display;
- Multiple 2D & 1D bar code decode
Datastrip, PDF-417, Code 39;
- Optional OCR-B capability;
- PCMCIA, USB, IR, Serial and
Smart card Interfaces;
- Wireless Capability (802.11);**
- Contactless Card Reading (CAC-C)**
- Scan all MRTD's

Verification Equipment Use



- **Portable** document / fingerprint scanner
 - Wireless Capability;
 - Crew Identity Verified by Nautical Inspector or USCG;
 - Expanded Smart Card capabilities
- **Fixed** Card and fingerprint scanner attached to a notebook or regular computer for enrollment



Partners

LISCR - Liberia is the world's premier open ship registry, renowned for quality, efficiency, safety and service.



Datastrip - is an innovative world leader in providing ICAO recognized 2D bar code software, hardware and mobile biometric verification devices.

Technology Partners

Datacard – The industry leader in high quality card issuance and production and card printers.

DatacardGroup

Identix - Identix is a multi-biometric security technology company and industry leader in fingerprint identification.

identix

ILO / IMO

- International Labour Organization
- International Maritime Organization

- ILO annual conference, June 3-19, Geneva
 - Hot Topic: **Seafarer ID Cards**, the technologies to be used and how to implement them

Results of ILO

- Seafarer's ID documents will include:
 - biometric template (fingerprint) to be stored **in a 2D bar code**
- Documents to be issued by country of nationality
- New ID will **not** substitute passport
- Neutral on who pays for cards
- Neutral on vendors for biometric and bar code



Liberian Identity Document

- **Seaman's Identification and Record Book**
 - ID - Identifies the holder as a Seaman
 - Record of sea service
 - Evidence of special qualifications and training
- **Issued based on holder's national Passport**
 - Passport must be kept by the vessel's master
- **Conforms to ILO Convention 108**
 - All Liberian Documents centrally issued

Reasons to Change

- US requires biometric documents – October, 2004
- ILO Convention 108 to be updated
- Make the ID harder to counterfeit
- Provide the seafarer with useful Port ID
- **No real standard / regulation in industry**

Biometric Trial Objectives

- Establish Remote Enrollment and Distribution
- Provide Verification of Card Holder & Card
- Match Applicant Biometric against Previous Applicants
- Develop Best Practices

Combat Identity Fraud

- Competency
- Training & Service
- Insurance & Medical

Improve Security

- Deter Terrorism
- Immigration



International Stakeholders

- Flag State - Government of Liberia
- International Maritime Organization – UN
- International Labor Organization – UN
- ICAO
- Port State Governments – over 100 countries
 - United States of America – one port state government
 - Department of Homeland Security
 - Immigration (Bureau of Citizenship and Immigration Services)
 - **TSA**
 - US Coast Guard
 - State and local authorities
 - Port authorities
 - Other agencies Department of Justice – FBI, CIA
 - EU States, China,
- Crewing States, Vessel Owners, Labor Unions, Seafarers



Choosing the Issuing Authority

Crewing State – seafarer’s country

- Numerous authorities required for verification
 - Possibility of numerous biometric standards
- No clear solution to stateless persons
- Denial of right to work for “Retired” seafarers
- Crewing States unwilling to issue compliant SID
- Some States are not ICAO 9303 Compliant

Flag-State – country ship is registered in

- All Crewmembers holding uniform documents
- Single point for verification
 - Single reader for biometric data
- Current issuer of STCW documentation
 - Based on positive identification of the seafarer from Passport

Biometric ID Challenges

- Which biometric?
 - Fingerprint, Iris, Facial
- Collection and verification of data
- Storage and retrieval of data
 - Where to put the biometric (Book, card)
- Protection of human rights
- Cultural considerations
- Multiple agencies with competing ideas
- Cost and reliability



Biometric Details

- Two designated fingers scanned at enrollment station
- Minutia based fingerprint template created
- No record of fingerprint image is kept or transmitted
- Fingerprint image cannot be made from template



On Board Enrollment



Fingerprint Enrollment

- Applications submitted electronically via SEA System

SEA - [Application.EDE]
File Edit Action Help

REPUBLIC OF LIBERIA BUREAU OF MARITIME AFFAIRS
APPLICATION FOR SEAFARERS' IDENTIFICATION BOOK, OFFICER'S CERTIFICATE, AND SPECIAL QUALIFICATIONS CERTIFICATES

Prev Next New Delete Duplicate Print Order Instructions MAKINEN, ELVIS S

Personal 1 Personal 2 Service Supporting Officer 1 Officer 2 SO's Fee Details 26 Agent Info ?

1. Documents Applying For:
 Seafarer's ID Book Officer Certificate Special Qualifications

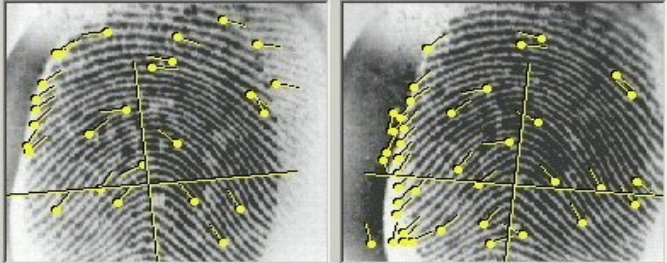
2. LAST NAME (FAMILY NAME) 3. FIRST NAME (GIVEN NAME) 4. MIDDLE INITIAL
MAKINEN ELVIS S

5. DATE OF BIRTH 6. PLACE OF BIRTH 7. CITIZENSHIP LATV
Day Month Year Ussr, Russia LATVIA
22 Apr 1971

8. HEIGHT 9. WEIGHT 10. HAIR COLOR 11. EYE COLOR
FEET 5' INCHES 11" CM POUNDS 194 KILOS BLACK BLACK

12. DISTINGUISHING MARKS (SCAR, BIRTHMARK, TATTOOS, ETC.) 13. SEX 14. ID. BOOKS
NONE MALE FEMALE NEW BOOK BOOK RENEWAL BOOK REPLACEMENT


Matched Aquired Fingerprints



Score: 782 Success, the prints match.

Success Cancel

this field.



Import Photo

gged Vessel, then an

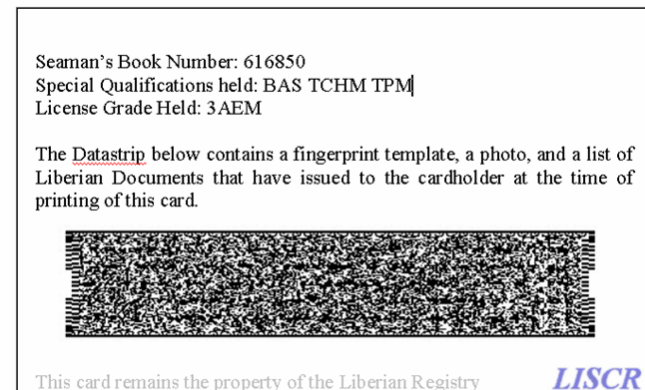
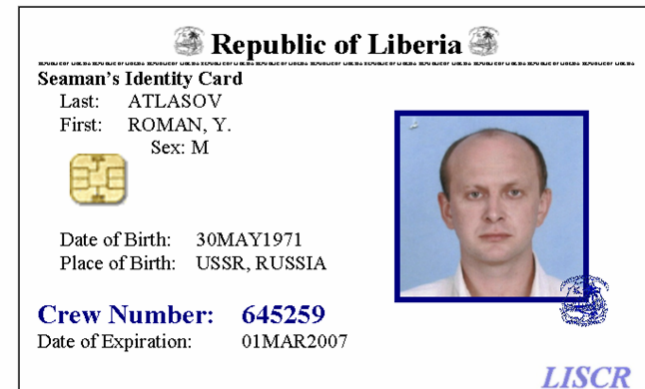
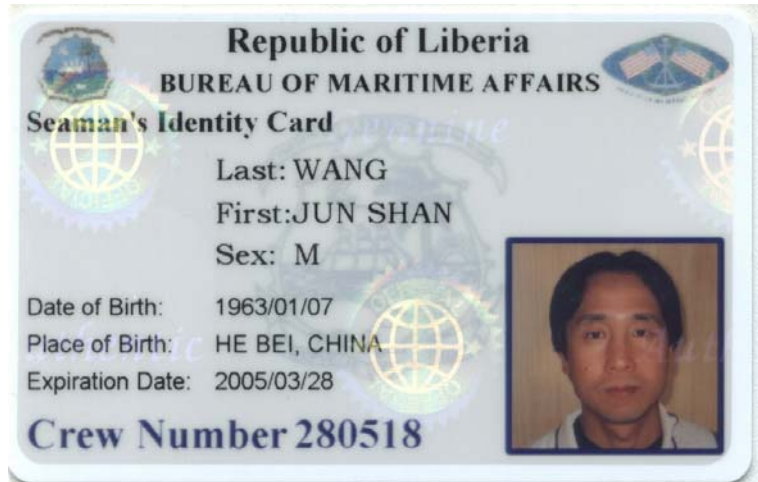
Biometric Verification

- Seaman's fingerprint scanned and compared against template stored on card
- No connection to a central database required, remote verification on ships
- Upon verification, will display photo and details encoded in Datastrip bar code
- Seaman's documents linked with common crew "FIN" number

Biometric Identity Card Features

- Personal Information & Color photograph
- Liberian crew file number
- 2D Barcode Datastrip
 - Containing Photo, **2 fingerprint templates** and list of special qualifications held (around 5 pages of text).
 - Aggressive Error Correction
- Tamper-proof security features
- Consideration of standards of:
 - ILO, IMO, ICAO
 - US Government (DOT, USCG, INS)
- Java Chip Smartcard Capable
 - Read-write capabilities

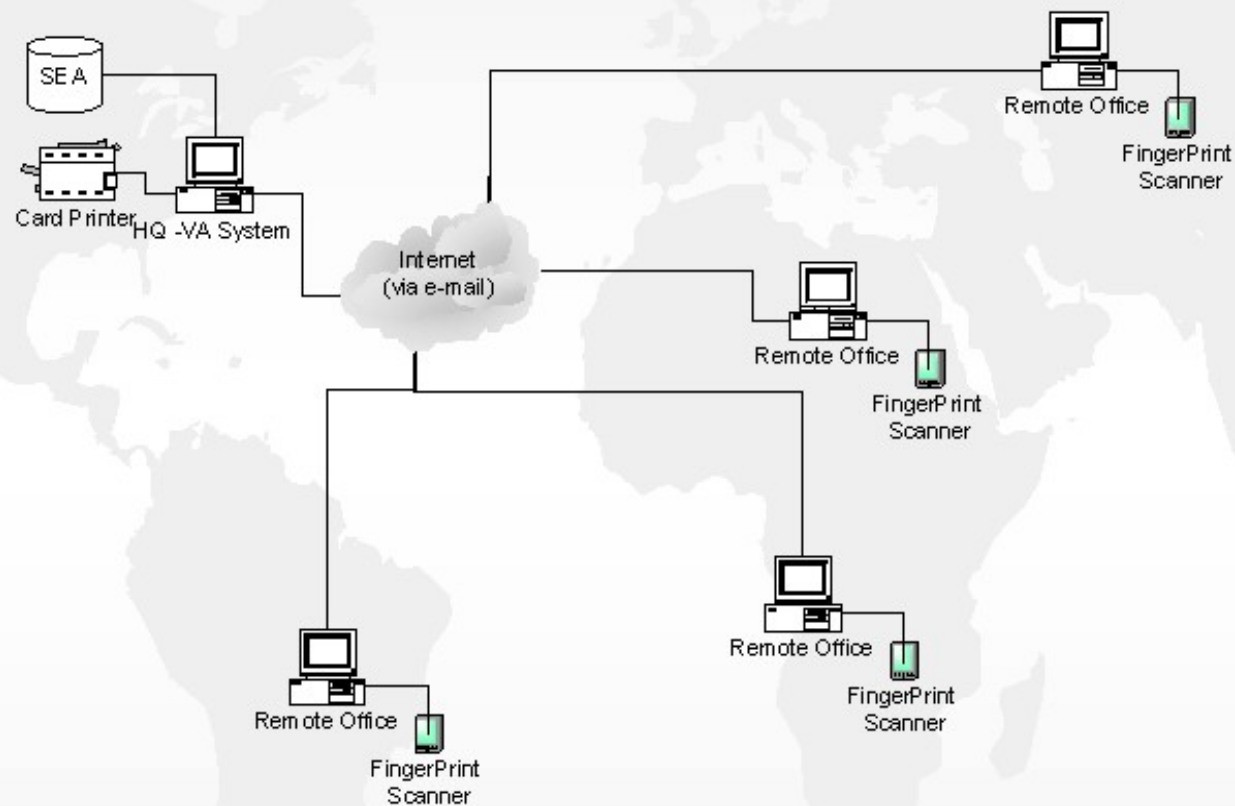
Actual Card Design



Data is transmitted for Processing

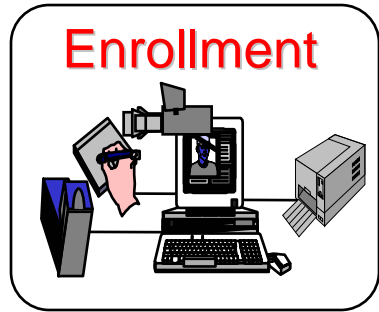


**Liberian International Ship
& Corporate Registry**

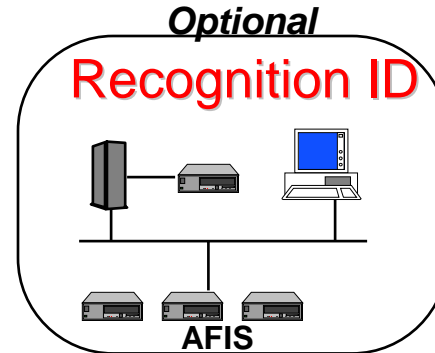


Solution Overview

Applicants



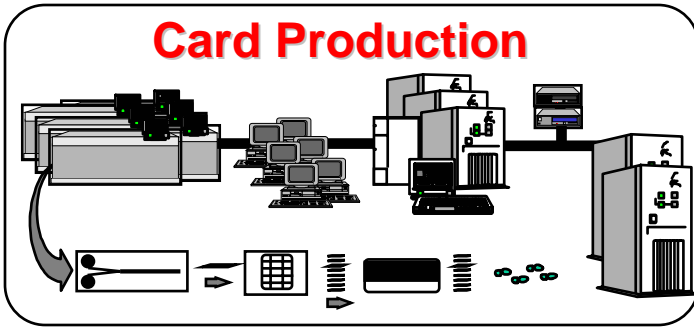
Enrollment
Biometric Capture
Photograph
Data Capture



Only once, during enrollment
One-to-many search
Central database required

Issuance

Card Production



Card Personalization, Barcode printing
Smart Card encoding, Lamination



Verification ID



Off Line
One to One



Thank You