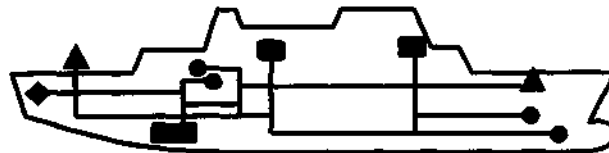

조선 : KS-STEP

2000. 8. 29.

KRISO 김 용 대

선박 STEP의 구성

- Ship Structural Envelope**
: hull form(AP216), arrangements(AP215), structure(AP218)
- Distributed Systems**
: piping(AP227), electrical(AP212), HVAC[AP227]
- Mission Subsystems/Equipment**
: mechanical(AP226), electronics[AP212], operation[AP234]
outfit and furnishings [FunSTEP], weapons

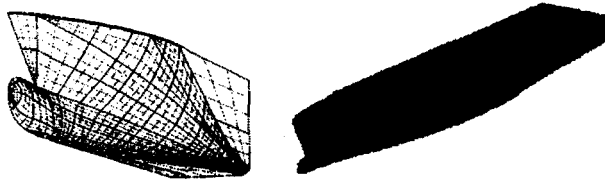


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AP 216, Ship Moulded Forms

Surface, wireframe and offset point representations
Design, Production and Operations lifecycles
General characteristics
Main dimensions
Hull form geometry
Major internal surfaces
Hydrostatics
Intact Stability tables



KS-STEP

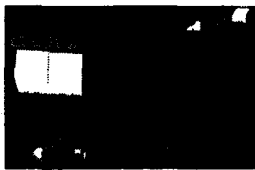
KRISO ydkim

AP 215, Ship Arrangements

Loading conditions

Compartments

- types
- properties (shape, coatings, adjacency, access....)

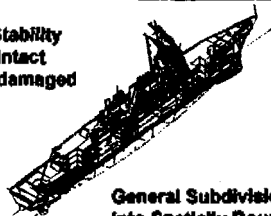


Zone Boundaries

- Controlling Access
- Design Authority
- Cargo Stowage
- Machinery Compartments
- Crew Occupancy
- Common Purpose Spaces

Stability

- intact
- damaged



General Subdivision of a Ship
into Spatially Bounded Region

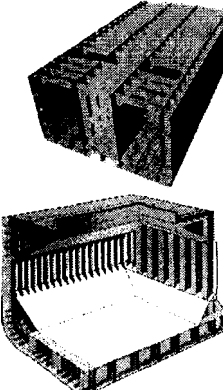
Cargoes

- assignment to compartments
- weight,
- centre of gravity

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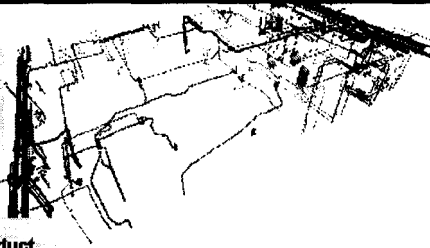
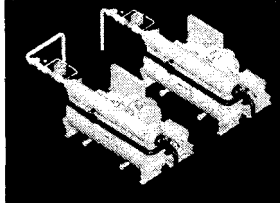
AP 218, Ship Structure

<p>Configuration Management</p> <ul style="list-style-type: none"> • Class Approval • Approval Relationship • Change Administration • Promotion Status <p>Weight Description</p> <p>Structural Parts</p> <ul style="list-style-type: none"> • Feature • Plate • Edge Content • Opening • Profile • Profile Endcut <p>Technical Description</p>	<p>Production Design Data</p> 	<p>General Characteristics</p> <p>Production Engineering Data</p> <p>Product Structure</p> <ul style="list-style-type: none"> • Generic Product Structure • System • Space • Connectivity • Assembly <p>Hull Cross Section</p> <p>Geometric Representation</p> <ul style="list-style-type: none"> • Wireframe • Complex Wireframe • Surfaces • Solids
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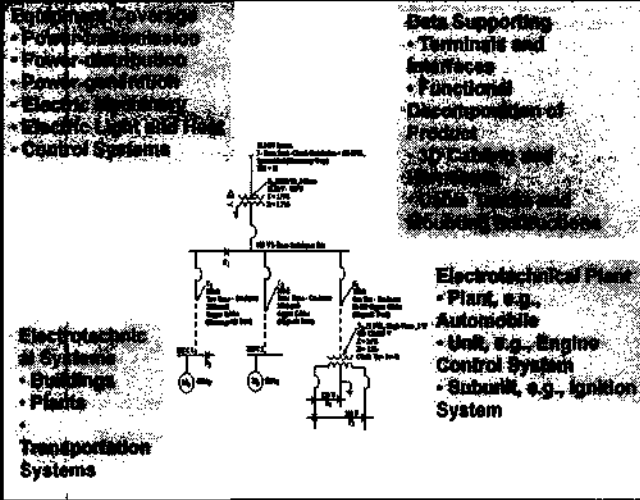
AP 227 Plant

<p>Pipe Stress Analysis</p> <p>Connectivity</p> <ul style="list-style-type: none"> • assembly • penetrations • ports <p>Pipe Flow Analysis and Sizing</p> <p>Configuration Management of Product Structure</p> <p>Versioning and Change Tracking</p> <p>Bill of Materials</p> <p>2-D and 3 -D Shape Representation</p> <ul style="list-style-type: none"> • Diagrammatic Presentation • Solid Model Presentation • Interference Analysis 	 
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AP 212, Electro-technical Design and Installation



- Equipment Coverage**
- Power transmission
 - Power distribution
 - Power conversion
 - Electric machinery
 - Electric Light and Heat
 - Control Systems

- Data Supporting**
- Terminals and Interfaces
 - Functional Decomposition of Products
 - 3D Catalogs and Assembly
 - Data generated during production

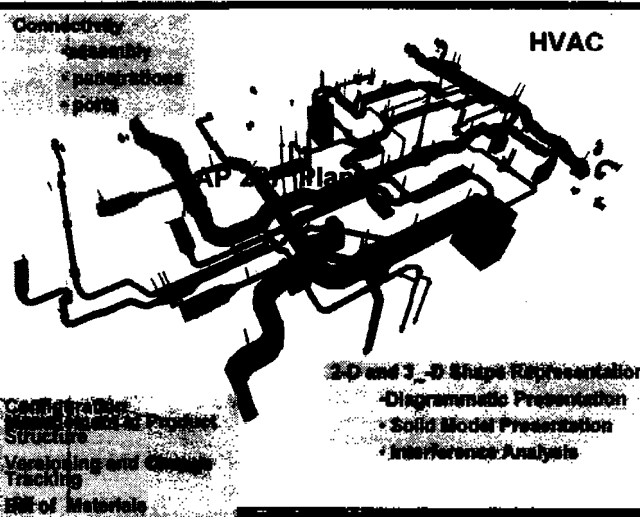
- Electrotechnical Systems**
- Buildings
 - Plants
- Transportation Systems**

- Electrotechnical Plant**
- Plant, e.g., Automobile
 - Unit, e.g., Engine Control System
 - Subunit, e.g., Ignition System

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AP 227 Plant



- Connectivity**
- Assembly
 - Parameters
 - Ports

HVAC

- Costs and Weight**
- Weight and Cost of Product Structure
 - Manufacturing and Group Tracking
 - Bill of Materials

- 3D and 2-D Shape Representation**
- Diagrammatic Presentation
 - Solid Model Presentation
 - Interference Analysis

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KRISO ydkim

AP 226, Ship Mechanical Systems

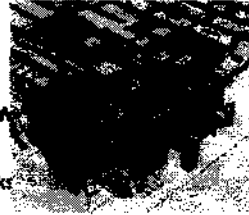
System Components

- Air Supply to Engine Room
- Exhaust Gas Removal
- Fuel Oil Treatment and Supply
- Engine Lubricating and Cooling
- Propulsion - Main Shaft/Couplings
- Maneuverability - Rudder/Thrusters
- Electrical Generation

Product Definition Information

- Connectivity Between Components and Systems
- Geometry, Materials, Topology and Tolerances
- Noise, Vibration and Shock Characteristics
- Component/System Life Cycle and Operational History

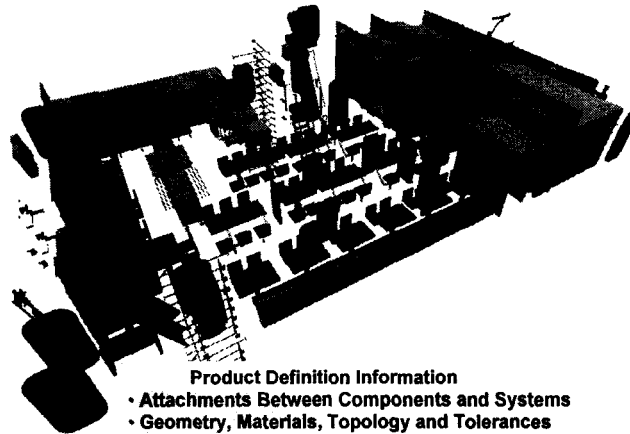
- Mechanical Components
- Main and Auxiliary Engines
- Pumps - Fuel Oil/Lubricating Oil/Cooling Water
- Air Compressors and Receivers
- Heat Exchangers
- Deck Machinery - Winches/Cranes/Derricks



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Outfit and Furnishings(FunSTEP)



Product Definition Information

- Attachments Between Components and Systems
- Geometry, Materials, Topology and Tolerances
- Protective Coating, Deck Covering, False Deck, Ceiling
- Manufacturer Name, Drawing, Interchangeability

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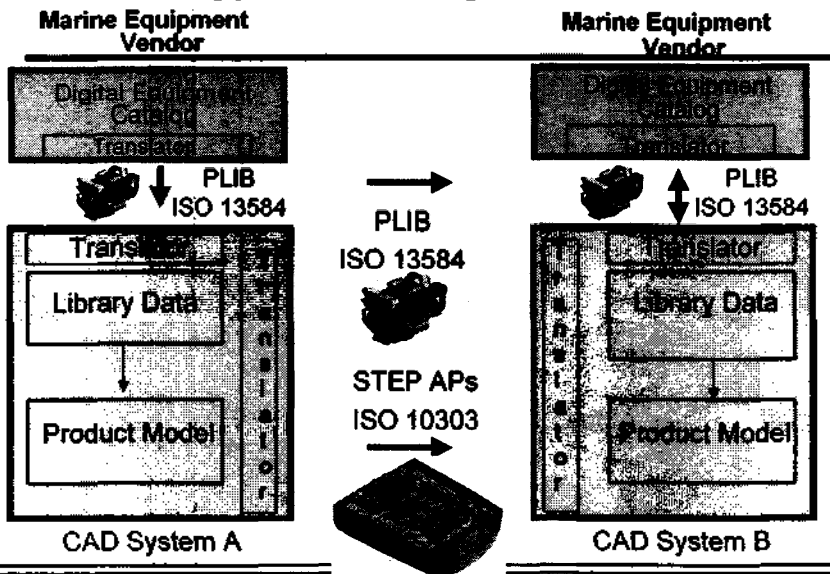
ISO 13584 (Parts Library)



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KHISU yakim

Typical Exchange Scenario



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KRISO ydkim

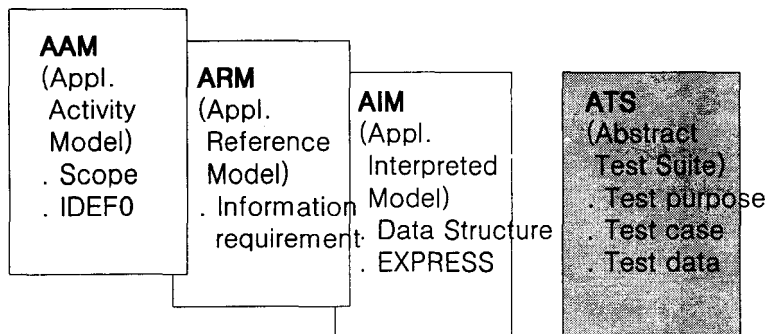
KS-STEP

- Korea Ship STEP Project
 - 과기부 특정연구 사업
 - 기간 : 1998. 9 - 2001. 7
 - 참여기관 : KRISO, KAIST, KR(한국선급)
대우중공업, 삼성중공업
 - 연구내용
 - ATS 318 국제공동 개발
 - STEP 시범시스템 개발 (조선소-선급간 정보교환)

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KRISO ydkim

STEP AP(응용프로토콜)의 구성

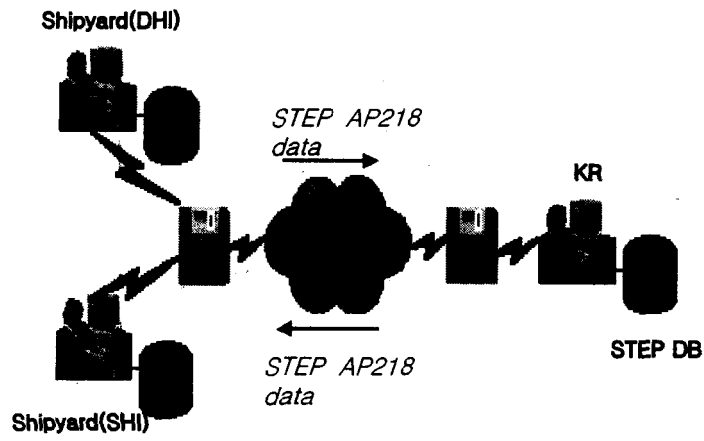


AP 2XX → ATS 3XX

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KRISO ydkim

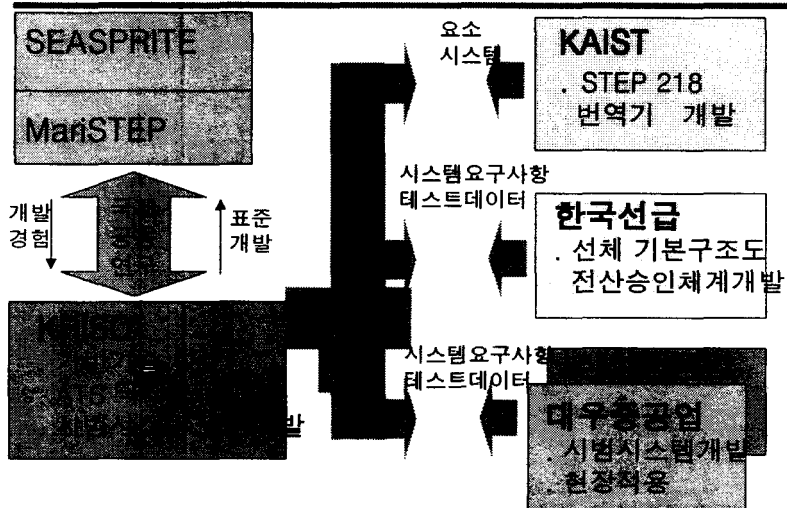
STEP 시범시스템



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추진전략



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KRISO ydkim

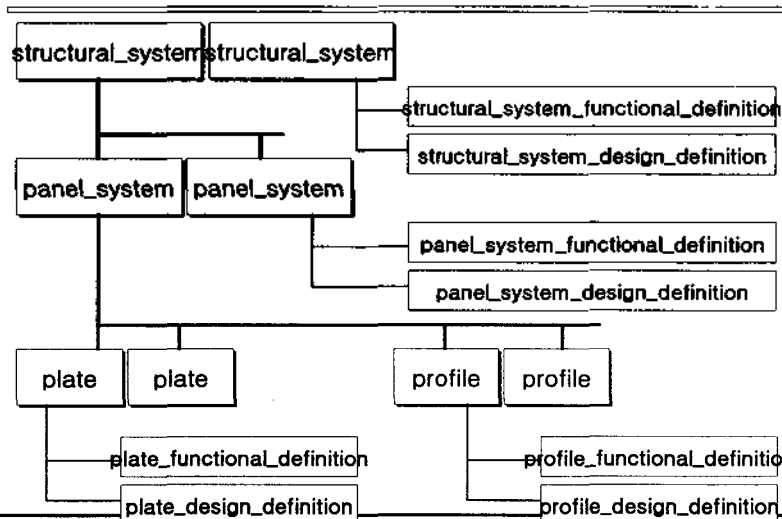
STEP ATS 318 WD 개발

- 국제공동연구
 - ISO STEP 회의 참가 (2000. 2. 호주) ; 참여기업 검토의견
 - ATS 318 개발 책임자로 공식 선임 (문서번호 발급)
 - SEASPRITE 연구사업 -> EMSA 와 협약 체결 추진
- ATC 1 : Midship 설계승인 정보
 - Design Object 추출 -> Test Purpose 작성
 - 입력 데이터 표준 작성
 - 출력 데이터 표준 개발
 - 테스트 판정기준 (Test Verdict)
- ATS 318 문서 기본 체제 작성
 - ISO ATS Development Guideline에 따른 체제 작성
 - ATC 1 포함.

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AP218 데이터 구조의 분석



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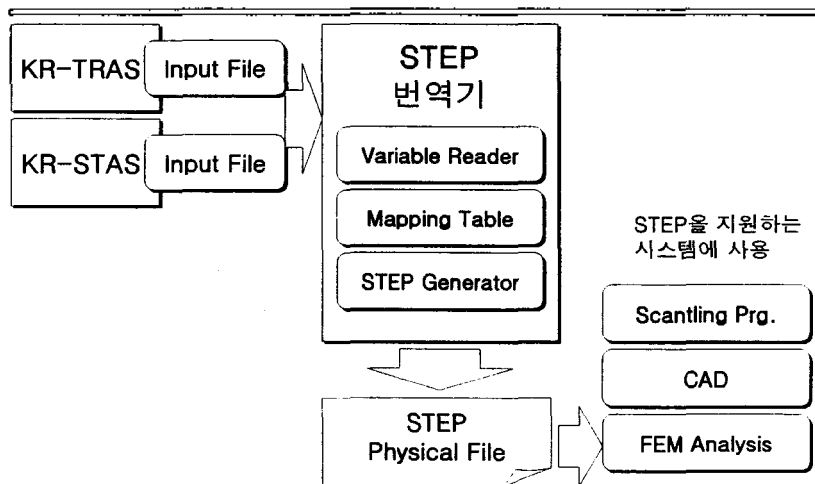
STEP 번역기 개발

- Midship 설계 승인 정보 번역기
 - AP 218 ARM based 입출력 번역기
 - 3차원 설계정보의 표현
 - KR - TRAS 시스템의 STEP 파일 생성 모듈 개발

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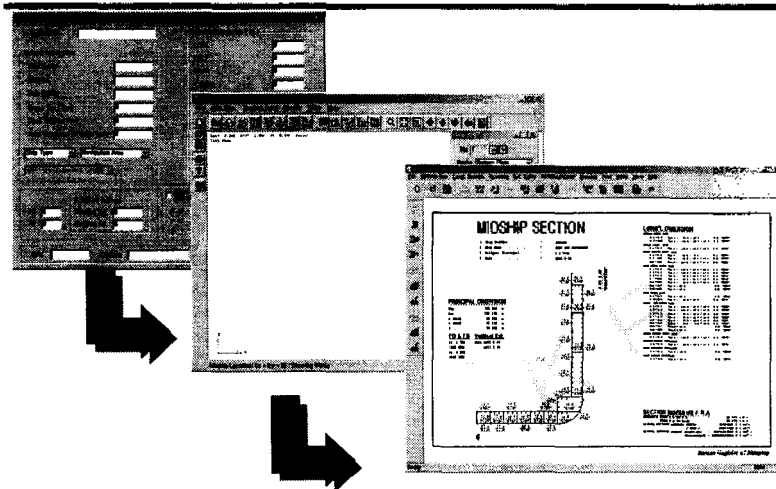
STEP 번역기



KS-STEP

KRISO ydkim

MidShip Scantling(in KR-TRAS)



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KRISO ydkim

Midship STEP Data

```
ISO 10303-21:
HEADER:

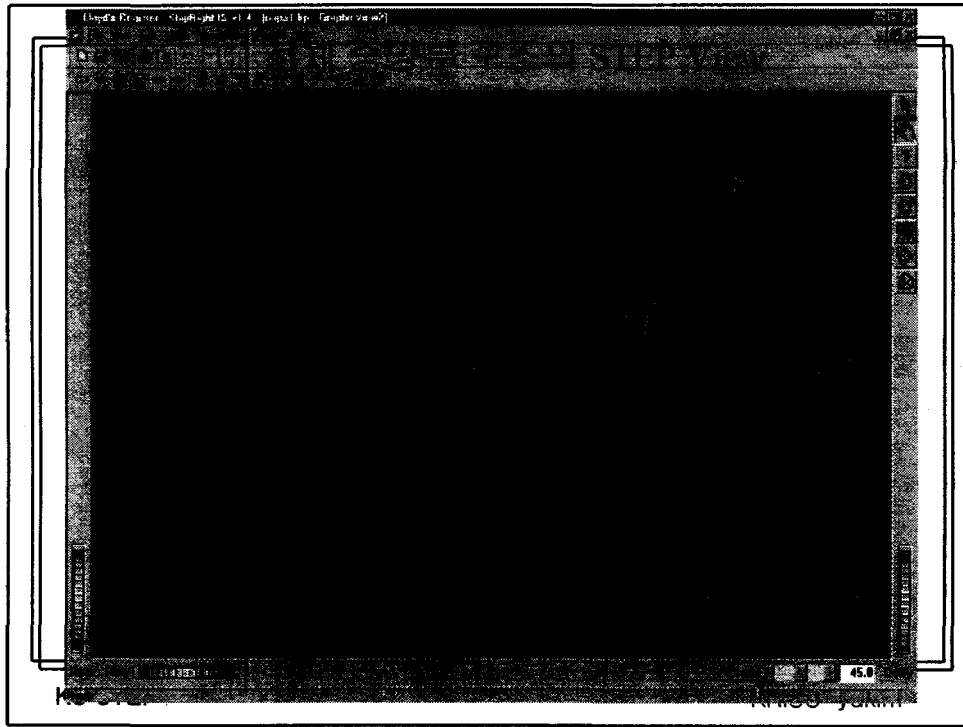
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/* description */ ('BoxType Ship STEP File'),
/* implementation_level */ ('2:1'));

FILE_SCHEMA (('AP218, LONG'));
ENDSEC;

DATA:
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#11=POLYLINE('', (#26, #27, #28, #29, #26));
#22=CARTESIAN_POINT('', (0., 0., 2500.));
#23=CARTESIAN_POINT('', (1000., 0., 2500.));
#70=PLATE_DESIGN_DEFINITION$, #138, (#94), $, $, 120., 20., 0., (#10), $);
#82=PLATE_FUNCTIONAL_DEFINITION$, #137, (#94), $, $);
#94=PLATE(#136, 'Inner Bottom Plate 1', $, $, #130);
#106=PANEL_SYSTEM_DESIGN_DEFINITION$, #135, (#118), $, $, $, 0., 0., $, $);
#112=PANEL_SYSTEM_FUNCTIONAL_DEFINITION$, #134, (#118), $, $, $);
#118=PANEL_SYSTEM(#133, 'BoxType_Shp Inner Bottom Panel', $, $, #130, $, (#94,
#95, #96, #97), $, $, $, $);
#124=STRUCTURAL_SYSTEM(#132, 'BoxType_Shp Bottom Structure', $, $, #130, $, $,
$, $, $, $);
#125=DATE_AND_TIME(#128, #127);
#126=COORDINATED_UNIVERSAL_TIME_OFFSET(9.0, AHEAD);
#127=LOCAL_TIME(10, 38, 20., #126);
#128=DATE(1999);
#129=NAMED_UNIT($);
#130=SHIP(#131, 'KS-STEP_Ship', $, 'KS_STEP BoxType_Ship', $, ());
#131=GLOBAL_ID('KS_STEP BoxType_Ship');
ENDSEC;
END-168-10303-21);
```

KS-STEP

KRISO ydkim



기대효과

□ 기술적 측면

- 중립형식의 데이터 표준이용기술 확보 : 산업기술 데이터의 독립성, 연속성 증대
- 조선소-선급 간의 온라인 데이터 교환 ; 기간/공수 단축
- 국내 업계의 프로세스가 반영된 국제표준 개발
- 조선/항정 CALS 구축의 공통핵심 기반기술 확보

□ 경제, 산업적 측면

- 국제표준 개발에 참여함으로써 국내 업계의 위상제고
- 조선산업/선급의 경쟁력 제고
- 해운산업 및 해군에서도 활용