

# Functions of IPCA Version 5

IPCA Version 5 consists of a basic program package with other applications available as options. (IPCA exclusively for use in performing Freeboard calculations is also available.)

Design-IPCA			
Name of Application	Function	Name of Application	Function
<b>Basic Set</b>	Calculations for: Hydrostatics Bonjean tables Cross curves Down-flooding angles Wind projected lateral area and wind heeling levers Tank capacities Sounding / ullage tables Center of gravity and trim Stability (IMO Res. A.749 (18) and 2008 IS-Code) Longitudinal strength Rolling period table Correction table of displacement due to trim Deadweight scale Freeboard (ICLL, JG Restricted Greater Coasting service and Coasting service) Bulk carrier safety requirements • Damage stability and longitudinal strength calculations in case of flooding of any cargo hold • Determination of allowable loads for each cargo hold as a function of draft • Determination of allowable loads for adjacent cargo holds as a function of draft • Preparation of loading and unloading sequences (IACS standard form)	<b>D-SDS</b>	Deterministic Damage Stability • ICLL • IBC Code • IGC Code • Annex I to MARPOL 73 / 78 • IMO Res. A.320 & A.514 • IMO Res. A.469 • IMO Res. A.534 Longitudinal strength
		<b>Lines Generator</b>	Generation of rough lines for new ships from original ship lines (1-CP method)
		<b>Container Arrangement</b>	Automatic determination of the arrangement and number of containers based on lines and form of holds
		<b>Grain Heeling Moment</b>	Calculation of grain heeling moments for each compartment (trimmed and untrimmed) (MSC.23 (59))
<b>P-SDS</b>	Probabilistic Damage Stability SOLAS II-1/B-1 (MSC.216 (82)) (Cargo ships only)		
<b>SOLAS Reg. 9.8</b>	Damage Stability for bottom damage SOLAS II-1/B-1 Reg. 9		
<b>Hardware Specifications (Recommended)</b> <ul style="list-style-type: none"> <li>• <b>System requirements:</b> Operative on one of OS below</li> <li>• <b>OS:</b> Windows* 2000, XP (32 bit)</li> <li>• <b>CPU:</b> Pentium II, III 400MHz or above</li> <li>• <b>Memory:</b> 128 MB or more</li> <li>• <b>Hard disk:</b> 2.1 GB or more</li> <li>• <b>Display:</b> Resolution of 1024 x 768 pixels or more</li> <li>• <b>CD-ROM:</b> CD-ROM drive</li> <li>• <b>Printer:</b> A4, A3 size paper for use with Windows*</li> </ul>			

Onboard-IPCA Calculation Engine			
Name of Application	Function	Name of Application	Function
<b>Basic Set</b>	Trim Intact stability (IMO Res. A.749 (18) and 2008 IS-Code) Longitudinal strength Grain stability (IMO Res. MSC 23(59))	<b>Development Environment</b>	<ul style="list-style-type: none"> <li>• <b>OS:</b> Windows* 2000, XP (32 bit)</li> <li>• <b>CPU:</b> Pentium II, III 400 MHz or above</li> <li>• <b>Memory:</b> 128 MB or more</li> <li>• <b>Developed using:</b> Microsoft Visual Studio 6.0</li> </ul>
<b>Damage Calculation</b>	Trim Stability Longitudinal strength Bulk carrier safety requirements • Damage stability and longitudinal strength calculations in case of flooding of any cargo hold • Determination of allowable loads for each cargo hold as a function of draft • Determination of allowable loads for adjacent cargo holds as a function of draft • Preparation of loading and unloading sequences (IACS standard form)		

\*Windows is the trademark of Microsoft Corporation, registered in the US and other countries.

PrimeShip

Integrated Program for Determining Ship Performance Capability

IPCA Version 5



# Integrated Program for Determining Ship Performance Capability

## IPCA Version 5

- PrimeShip-IPCA (Integrated Program for Determining Ship Performance Capability) is a PC Windows-based program developed by ClassNK for determining trim, stability, longitudinal strength, freeboard, grain heeling moment, and other similar factors pertaining to ship performance capability. IPCA is one of a number of programs and services comprising the PrimeShip concept for total lifetime ship care.
- IPCA consists of two types of specialized applications: Design-IPCA for use in evaluating performance characteristics during ship design, and the Onboard-IPCA Calculation Engine which is used as a base calculation program for onboard loading instruments. IPCA is a convenient and powerful tool for shipbuilders and designers, shipowners, ship operators and other users.
- IPCA Version 5 is an improved version conformable to the latest rules and regulations by adding various functions and I/O methods with enhanced improvements in operation time and calculation accuracy.

### Main Features and Merits of IPCA

- Design work can be done efficiently by inputting data while checking the resulting shapes on the screen. Measures are taken to facilitate the inputting and outputting of data.
- The intuitive arrangement of the data interface allows users to operate the system without long hours of training.
- The input data for each ship is kept in a dedicated IPCA database and handled in a unified manner. Thus, existing information need not be re-entered for each different application.
- Design-IPCA data can be easily transferred as it is and used with the Onboard-IPCA Calculation Engine.
- The operation part of Onboard-IPCA is the same as that of Design-IPCA, so calculation results are the same for both.
- IPCA facilitates the prompt evaluation and approval of design stability and longitudinal strength by the Society, as well as the assignment of freeboard.
- IPCA is continually updated and maintained by ClassNK in order to reflect the latest changes in relevant international requirements and ClassNK rules. The most recent versions are always provided to users through timely upgrades.

### Main Functions of IPCA

- **Complete calculation of all elements of ship performance capability**
  - Ship lines, hydrostatics, tank capacity, trim and stability, longitudinal strength
  - Deterministic damage stability, probabilistic damage stability, bottom damage stability (SOLAS II -1/B-2 Reg.9.8)
  - Freeboard calculations
  - Grain heeling moment
- **Bulk carrier safety related functions (Chapter XII of SOLAS'74)**
  - Damage stability and longitudinal strength calculations in case of flooding of any cargo hold
  - Determination of allowable loads for each cargo hold in keeping with changes in draft
  - Determination of allowable loads for adjacent cargo holds in keeping with changes in draft
  - Preparation of loading and unloading sequences (based on IACS standard form)
- **Detailed calculations for final documents**
  - Highly accurate detailed calculations for final documents
  - Final documents such as correction tables of displacement due to trim, volume curves, sounding/ullage tables, deadweight scales, amongst others
- **Interface with other systems**
  - Supply of base data and calculation results to other program systems via CSV file

## Overview of IPCA Version 5 system

