

The certification body of TÜV Informationstechnik GmbH hereby awards this certificate to the company

**Havenbedrijf Rotterdam N.V.**  
**Wilhelminakade 909**  
**3072AP Rotterdam**  
**The Netherlands**

to confirm that its software product

**HaMIS, version 1.30.0**

fulfils all requirements of the SIG/TÜVIT Evaluation Criteria

**Trusted Product Maintainability V3.0**  
**Level: ★★★★★ (5 stars)**

of Software Improvement Group and TÜV Informationstechnik GmbH. The requirements are summarized in the appendix to this certificate.

The appendix is part of the certificate and consists of 4 pages.

The certificate is valid only in conjunction with the corresponding evaluation report until 2013-07-31.



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Head of Certification Body

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**Certificate**

## **Certification System**

**TÜV**<sup>®</sup>

The certification body of TÜV Informationstechnik GmbH performs its certification on the basis of the following product certification system:

- German document: "Zertifizierungsschema für TÜViT Trusted-Zertifikate der Zertifizierungsstelle TÜV Informationstechnik GmbH", version 1.0 as of 2010-05-18, TÜViT GmbH

## **Evaluation Report**

- "C2011-0639, Harbour master Management and Information System, SIG-Evaluation-Report, Trusted Product Maintainability", version 4 as of 2011-07-26, Software Improvement Group

## **Evaluation Requirements**

- "SIG/TÜViT Evaluation Criteria – Trusted Product Maintainability", version 3.0 as of 2011-01-01, Software Improvement Group (SIG) and TÜV Informationstechnik GmbH (TÜViT)

## **Evaluation Target**

- Software product HaMIS (Harbour master Management and Information System), version 1.30.0 of Havenbedrijf Rotterdam N.V. as of 2011-05-26
- Product description of the software product HaMIS, version 1.30.0, ("Certification High-Level Description Form" version 3 as of 2011-07-19, Havenbedrijf Rotterdam N.V.)

### Evaluation Result

The overall quality level of maintainability for the evaluated product is 5 out of 5 possible stars (★★★★★) according to the evaluation criteria.

This rating was derived from the ratings of the quality sub-characteristic of maintainability that are determined by the measurement of the source code properties.

Results and interdependencies between sub-characteristics and product properties are summarised in the following table. Details can be found in the evaluation report.

Quality Sub-Characteristic \ Product Property	Volume	Duplication	Unit Size	Unit Complexity	Unit Interfacing	Module Coupling	Result
<b>Analysability</b>	X	X	X				★★★★★
<b>Changeability</b>		X		X		X	★★★★★
<b>Stability</b>					X	X	★★★★★
<b>Testability</b>			X	X			★★★★★

### Summary of the SIG/TÜViT Evaluation Criteria

The SIG/TÜViT Evaluation Criteria Trusted Product Maintainability specify five increasing quality levels of software product characteristic maintainability and its sub-characteristics analysability, changeability, stability, and testability. The different levels are represented by one (★) to five (★★★★★) stars.

The determination of the quality levels is based on the measurement of software product properties by source code analysis. These product properties are volume, duplication, unit complexity, unit size, unit interfacing and module coupling. (see table above)

To obtain the rating, the measurements of the product properties are calibrated against a benchmark repository containing a large number of comparable software products. The relative number of products in the repository to which a given number of stars is assigned for a specific property shall follow the distribution:

- ★★★★★: 5 % of the products
- ★★★★★: 30 % of the products
- ★★★★★: 30 % of the products
- ★★★★★: 30 % of the products
- ★★★★★: 5 % of the products

The best 5 % of the products of the repository in terms of a given property receive five stars; the next 30 % of the products four stars and so on. The last 5 % of the products finally receive one single star.

A certificate can be issued for software products having successfully passed the evaluation and reaching an overall level of at least three stars for the characteristic maintainability and a minimum of two stars for each sub-characteristic.

Furthermore the software product description must fulfil the following requirements:

- The description identifies the product boundaries and its overall function.
- The description identifies all top-level components of the product.
- The description of the top-level components is such that any software artefact within the evaluation scope belongs to exactly one top-level component.
- The description identifies the role of each top-level component in the product.
- The description contains top-level components of appropriate number and size to facilitate maintenance of the product.

The description shall give a global overview of the software product architecture.