



Thesis Defence

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Thesis Information

Title of the thesis

Interaction of design-production stages in hull and piping shipbuilding works.

FOCUS AREAS OF WORK- SHIP PRODUCTION,ECONOMICAL ANALYSIS AND DESIGN ATTRIBUTES .

Supervisor: Prof.Ionas Ovidiu, "Dunarea de Jos" University of Galati.

CONTENT OF THE THESIS

1.INTRODUCTION

2.SOFTWARE DESCRIPTION

3.DETAILED DESIGN AND PRODUCTION INFORMATION STAGES OF HULL AND PIPING WORKS

4.SHIP PRODUCTION AT THE SHIPYARD

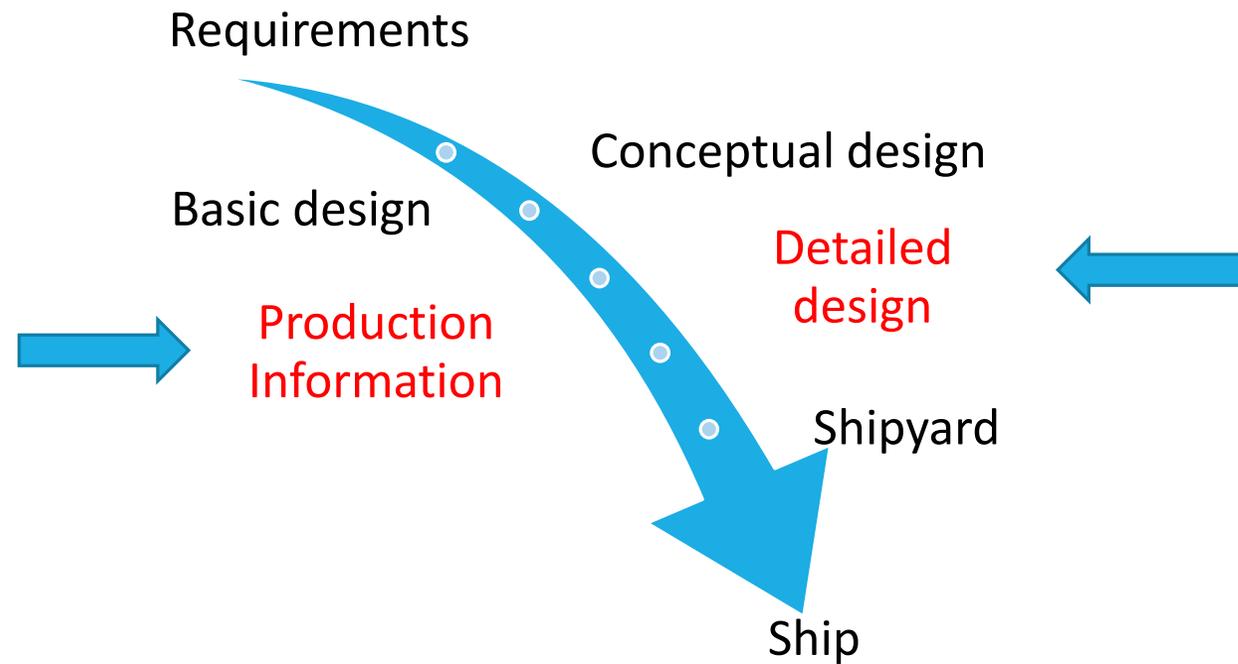
5.ECONOMIC ANALYSIS

6.CONCLUSIONS

7.QUESTIONNAIRE SESSION

INTRODUCTION

THE STAGE AT WHICH THE THESIS IS CARRIED OUT

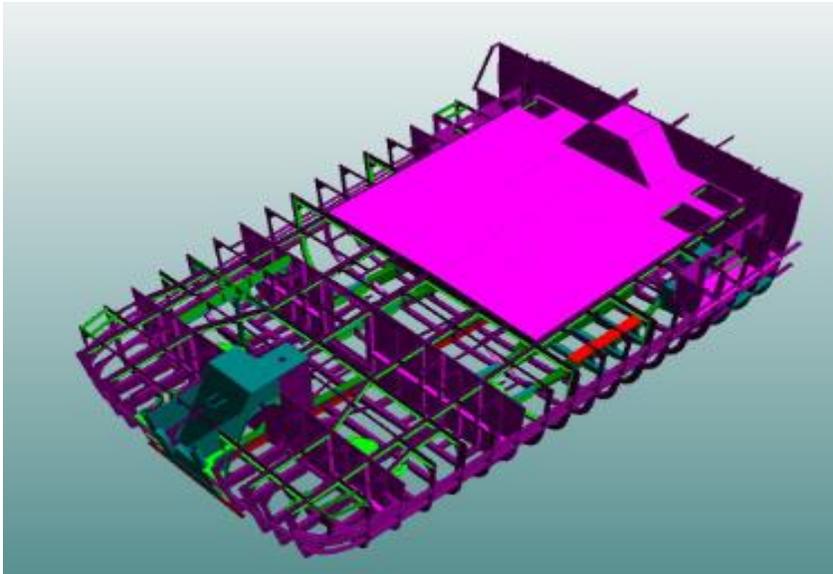


INTRODUCTION

CRITICAL AREAS WHERE THE THESIS IS CARRIED OUT



HULL



PIPING



SOFTWARE DESCRIPTION

SOFTWARES USED IN THE THESIS DEVELOPMENT

- NUPAS-CADMATIC
- AUTONESTING
- AUTOCAD

POSSIBLE OPTIONS OF USING OTHER SOFTWARES FOR MODELLING

- AVEVA MARINE
- NESTIX

SOFTWARE DESCRIPTION

NUPAS CADMATIC SOFTWARE

A BLEND OF TWO MODULES WHERE NUPAS IS USED FOR HULL DESIGN AND CADMATIC IS USED FOR PIPING DESIGN.

AUTOCAD

A COMMONLY USED DRAFTING SOFTWARE FOR CREATION OF DRAWINGS AND PROVIDING ANY ADDITIONAL INFORMATION

AUTONESTING

A SPECIAL NESTING SOFTWARE USED FOR THE NESTING OPERATIONS OF THE PLATES

DETAILED DESIGN AND PRODUCTION INFORMATION STAGES

STAGE 1

- CREATION OF THE 3D MODEL
- AT THE DESIGN OFFICE

STAGE 2

- EXTRACTION OF INFORMATION MADE FROM 3D MODEL
- AT THE DESIGN OFFICE

STAGE 3

- PRODUCTION USING THE INFORMATION
- AT THE SHIPYARDS

DETAILED DESIGN AND PRODUCTION INFORMATION STAGES

PIPING PART OF THE PACKAGE

DETAILED DESIGN STAGE

- ASSEMBLY DRAWINGS

PRODUCTION INFORMATION STAGE

- PIPE ISOMETRICS
- PIPE SCHEMATICS
- SPOOL DRAWINGS
- BILL OF MATERIALS
- ISO SKETCHLIST
- DESCRIPTION OF MATERIALS FOR A SECTION

DETAILED DESIGN AND PRODUCTION INFORMATION STAGES

HULL PART OF THE PACKAGE

DETAILED DESIGN STAGE

- ASSEMBLY DRAWINGS

PRODUCTION INFORMATION STAGE

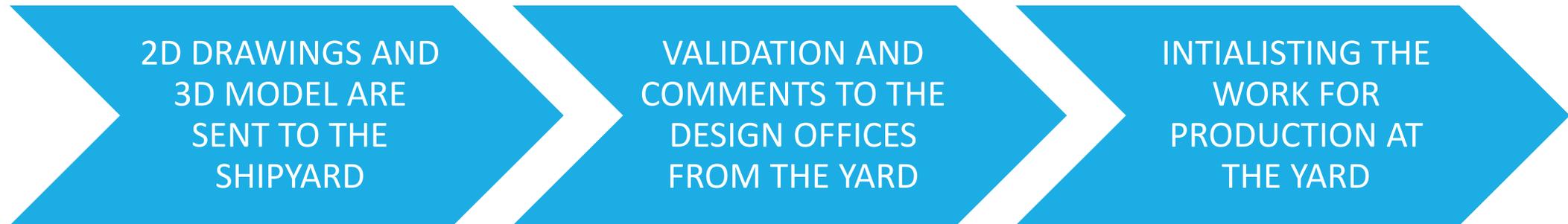
- LIST OF MATERIALS
- PART SKETCHES
- PROFILE SKETCHES AND PANEL SKETCHES
- ASSEMBLY SKETCHES

DETAILED DESIGN AND PRODUCTION INFORMATION STAGES

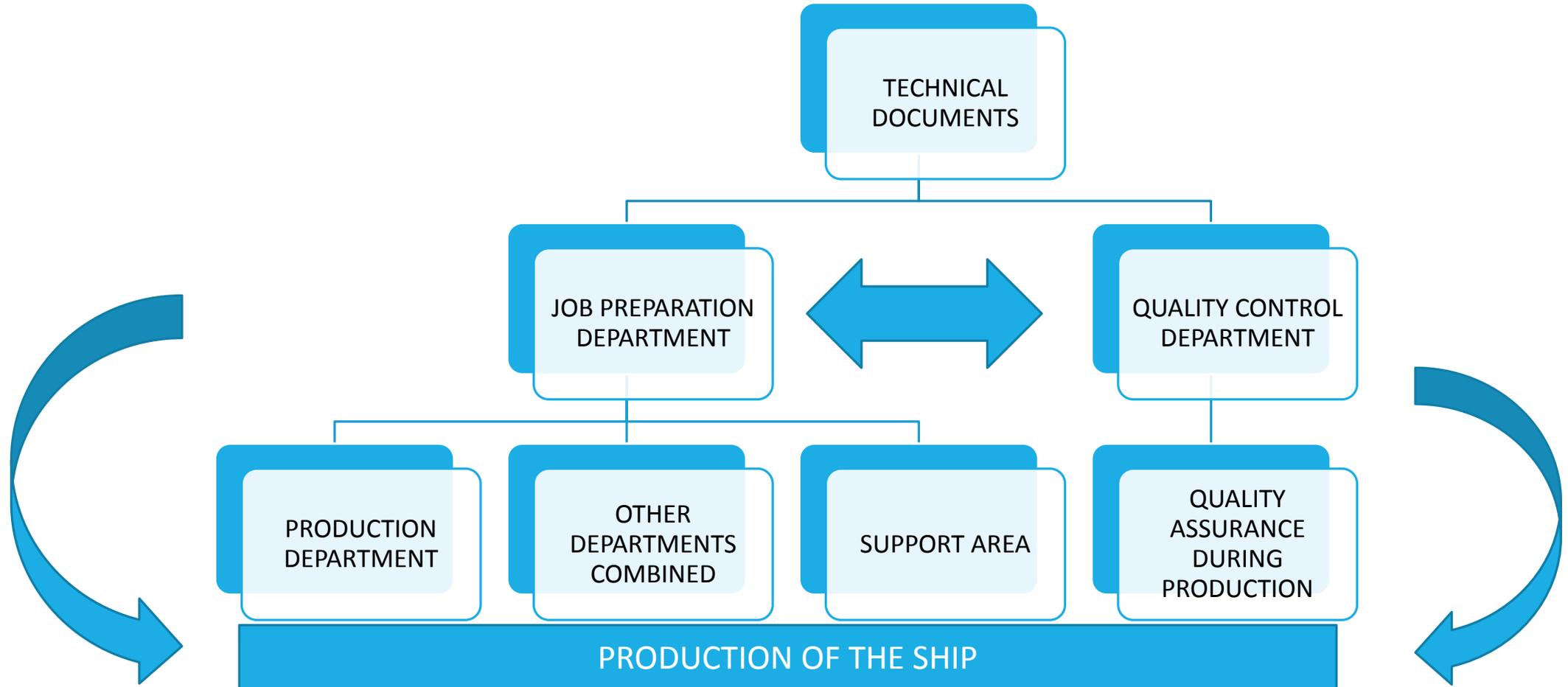
ADDITIONAL INFORMATION FOR THE ACTIVITIES

- NESTING OPERATIONS
- BENDING OF PLATES FOR THE HULL

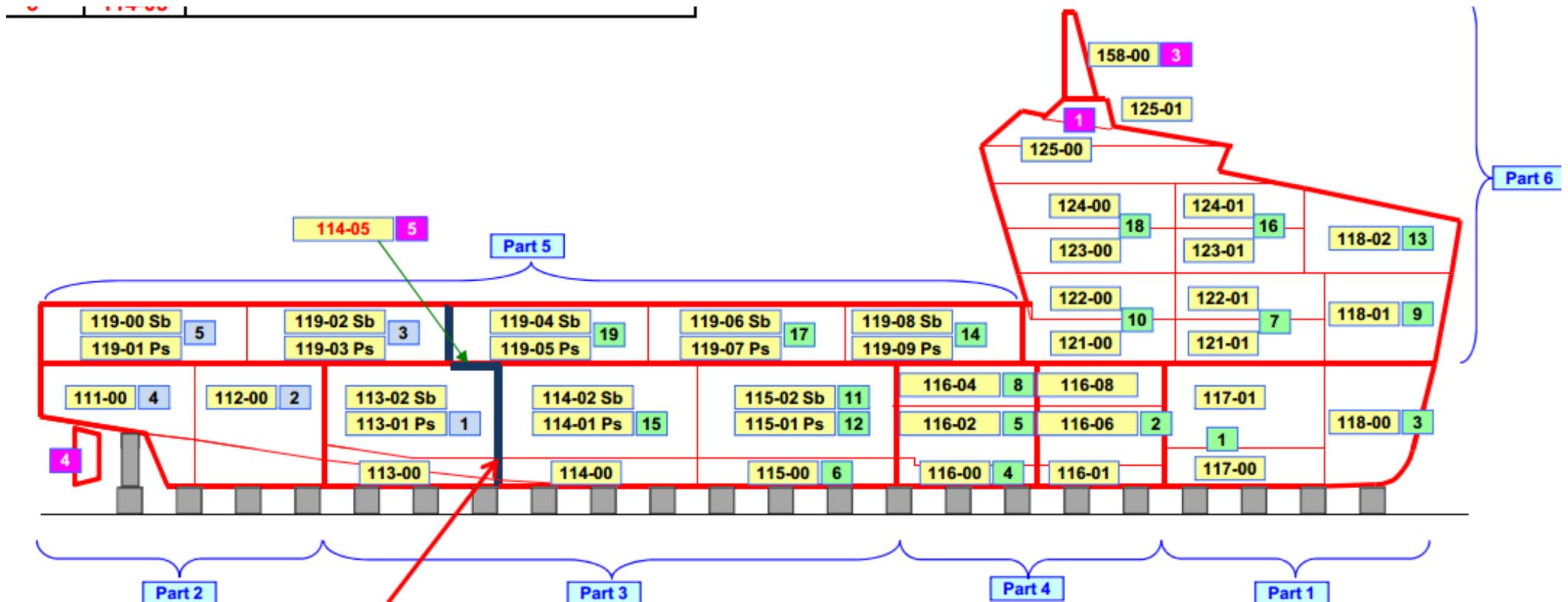
SHIP PRODUCTION AT THE SHIPYARD



SHIP PRODUCTION AT THE SHIPYARD



SHIP PRODUCTION AT THE SHIPYARD



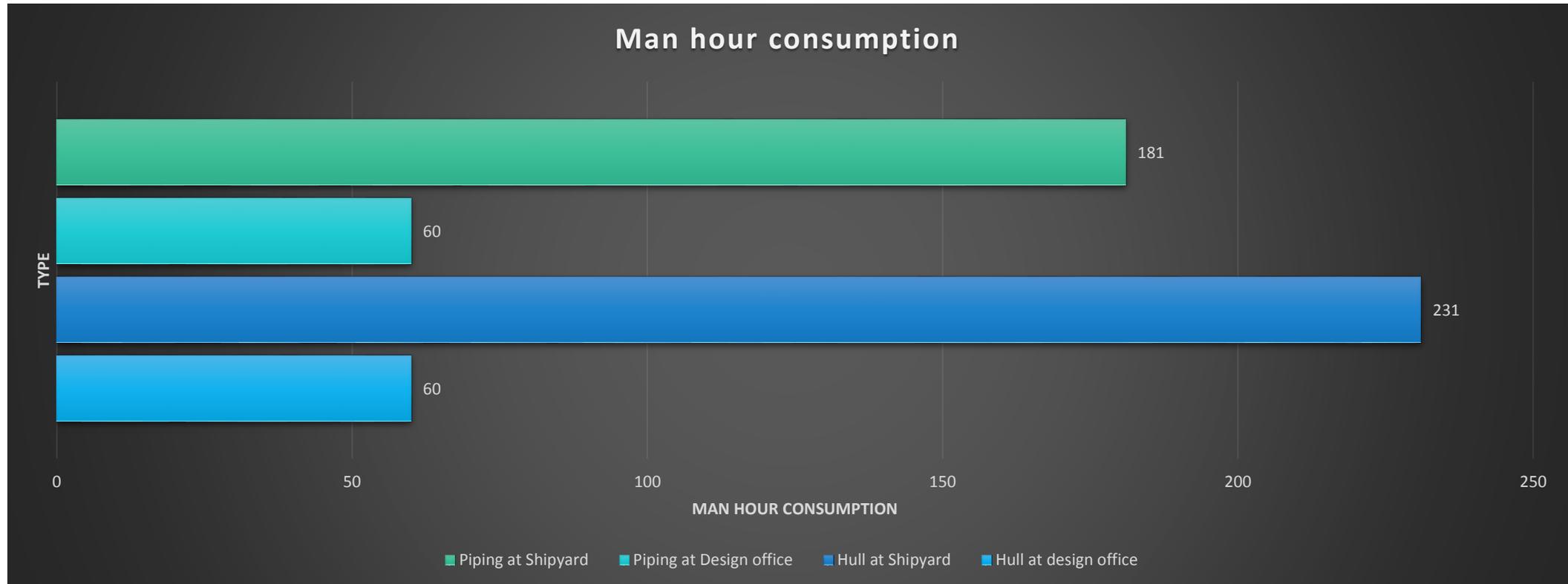
BLOCK BASED BUILDING IN THE SHIPYARD (SOURCED FROM DAMEN SHIPYARDS, GALATI)

ECONOMIC ANALYSIS

THIS ECONOMIC ANALYSIS WOULD VARY OVER A PERIOD OF TIME BY THE MAN HOUR CONSUMPTION WOULD BE CLOSE TO THE NUMBER OBTAINED

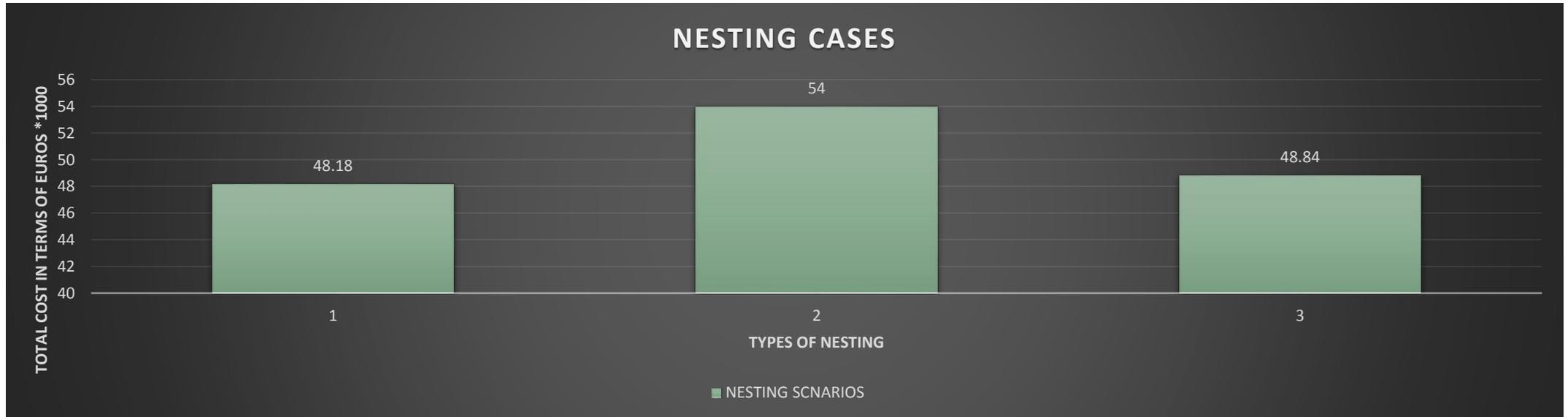
- HULL PART
- PIPING PART
- NESTING PART
- BENDING OF PLATES

ECONOMIC ANALYSIS



MAN HOUR CONSUMPTION AT THE HULL AND PIPING AREAS AT THE YARD AND DESIGN OFFICE
COST PER MAN HOUR AT THE DESIGN OFFICE AND SHIP YARD IS 45 AND 30 EUROS PER MAN HOUR RESPECTIVELY.

ECONOMIC ANALYSIS



TOTAL COST INCLUDES MATERIAL COST AND DESIGN COST

DESIGN COST PER MAN HOUR- 45 EUROS/HR

MATERIAL COST PER TONNE- 1000 EUROS

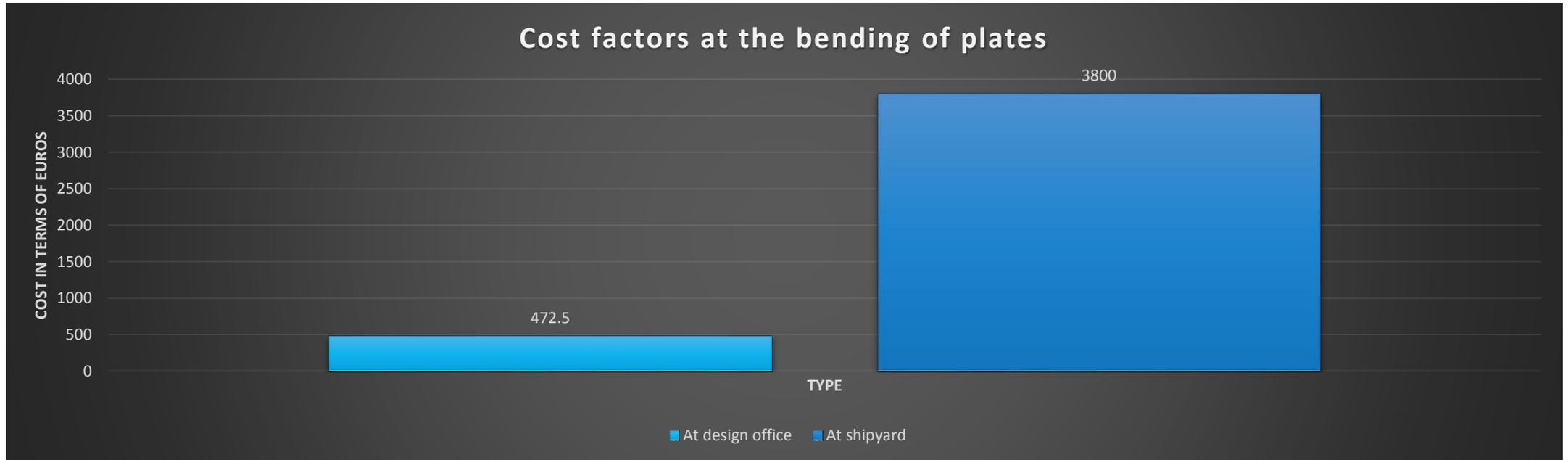
ANALYSIS FOR A BLOCK OF 40 TONNES AND FOR ONE BLOCK

CASE 1 – MANUAL AUTOMATED NESTING

CASE 2 - QUICK AUTOMATED NESTING

CASE 3 - AUTOMATED NESTING

ECONOMIC ANALYSIS



AVERAGE NUMBER OF PLATES PER SECTION-7

NUMBER OF SECTIONS CARRIED OUT-1

COST OF MATERIAL-1000 EUROS/TON

COST OF MAN HOUR AT DESIGN OFFICE-45 EUROS/MAN HOUR

COST OF MAN HOUR AT SHIPYARD -12 EUROS/MAN HOUR

ECONOMIC ANALYSIS

Final Analysis

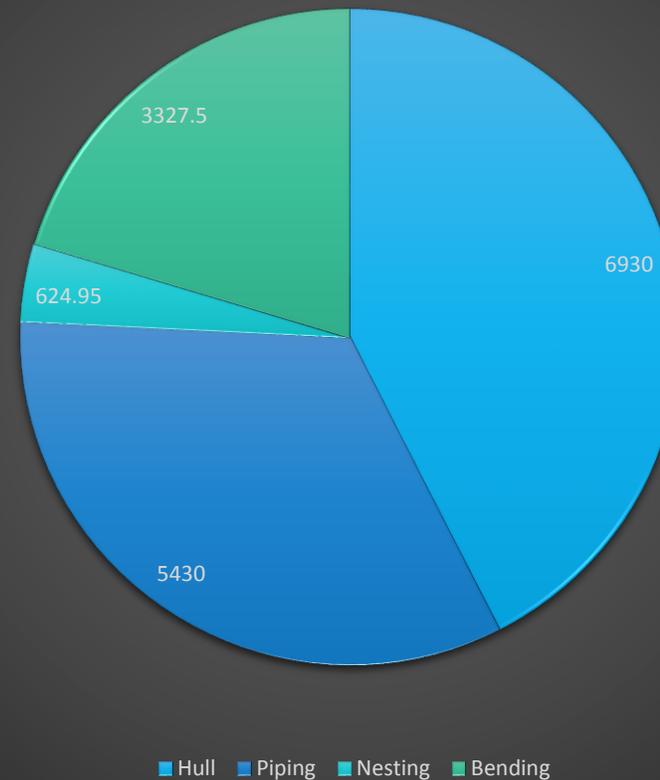
Per section

Total savings -16312 Euros

If a ship has 20 sections

Total savings -326249 Euros

Cost savings for a ship section



CONCLUSIONS

- SPENDING MORE TIME AT THE DESIGN OFFICES ON DESIGN AND PRODUCTION INFORMATION STAGES HELPS THE SHIPYARDS IN COST SAVINGS.
- LOWER SKILLED LABOUR AT THE YARDS AND REDUCTION OF IN-HOUSE WORKERS AT THE YARD IN TERMS OF DESIGN.
- TIME CONSUMPTION SAVINGS AND STRUCTURED FLOW FROM DESIGN OFFICES TO SHIPYARDS.
- MATERIAL CONSUMPTION SAVINGS.

QUESTIONNAIRE SESSION

MULTUMESC

THANK YOU

GRACIAS

DANKIE

PALDIES

GRAZIE

MERCI

TAKK

KIITOS

TERIMA KASIH

REDANKT