**Outline for Paper #3:”Comparison of exergetic efficiency definitions for offshore processes and systems”**

(or something similar for the title?)

Ideas

* Short debriefing of the general theory behind exergy
* Presentation and discussion of the different concepts of exergy efficiency (and exergy performance indicators? e.g. exergy destruction ratio, efficiency defect, irreversibilities-to-input rate?)
* Structure: abstract/introduction/methodology (theory)/methodology (case studies)/results/discussion/conclusion?

Question #1: Is the classic IMRAD structure appropriate? If yes, how to present and discuss our work in the best way? If no, which structure to adopt?

Abstract

1. Introduction
2. Methodology

Theory (1)

* Reminder of the exergy concept
* Exergy of a system
* Relation to the environment and dead state
* Exergy components of a system (physical, chemical, kinetic, potential, nuclear) (recall of the equations for a system?)
* Exergy balance/accounting
* Exergy balance for an open control volume (rate-exergy balance)
* Exergy transfer with energy (recall of the equations for energy)
* Exergy transfer with streams of matter (recall of the equations for material streams)
* Conceptualisation of exergy destruction/loss/product/fuel/transit
* Exergy destruction = internal irreversibilities
* Exergy losses = external irreversibilities
* Exergy product = desired result in terms of exergy
* Exergy fuel = necessary resources to spend in terms of exergy
* Exergy transit = not consumed exergy

Theory (2)

* Exergetic efficiency
* “Total” or “overall” efficiency = input/output (ref. Lior, Grassmann, etc.)
* “Functional” (increase/decrease) (ref. Baehr)
* “Functional” (is it actually in the functional category or…?) with transit (ref. Kostenko, Brodyansky, Sorin, Paris) – useful exergetic coefficient
* 1st definition
* 2nd definition (taking into account losses)
* “Functional” (fuel/product)
* Kotas/Oliveira/Voldsund Case: perfect separation plant: exergy difference between inlet and outlet
* Kotas/Rian&Ertesvåg/Cornelissen (takes into account the physical exergy (from balance) and in definitions of fuel and product) *Cases: air distillation column, natural liquefaction plant, crude oil distillation plant*
* Tsatsaronis (physical exergy differences – no decomposition of the different exergy terms into their subterms)
* Lazaretto/Tsatsaronis (physical exergy differences – application of the SPECO method) – decomposition of the chemical exergy into nonreactive and reactive, decomposition of the physical exergy into thermal and mechanical