**Portfolio**: Aerospace

**Division**: Aerospace Engine Systems

**Work Location**: Trollhättan

**Legal Employee Entity**: GKN Aerospace Sweden AB

**Vacancy Title**: Master Thesis in CAE

**Justification:** Andreas Borg

# Role Purpose

**Om GKN Aerospace**:

*GKN Aerospace is the aerospace operation of GKN plc, serving a global customer base and operating in North America and Europe. With sales of £2.2 billion in 2014, the business is focused around three major product areas - aerostructures, engine products and transparencies, plus a number of specialist products - electro-thermal ice protection, fuel and flotation systems, and bullet resistant glass. The business has significant participation on most major civil and military programmes. GKN Aerospace is a major supplier of integrated composite structures, offers one of the most comprehensive capabilities in high performance metallics processing and is the world leading supplier of cockpit transparencies and passenger cabin windows.*

**Projektbakgrund**:

Non-conformance of weld operations within production lines drives production cost, especially in the industrialization phase. The process of generating analysis results based on deviations in the geometry is time consuming and includes several repetitive tasks.

Hence, the purpose of this thesis assignment is to improve the process of going from GOM point cloud to Mesh for non-conformance weld analysis.

# Key Responsibilities

**Proposed thesis title:** CAE – Pre process method development to improve non-conformance weld analysis

**Period of time and amount of credits:** *30 credits/20 weeks.*

**Number of students:** 1

**Start date:** Spring 2018

**Uppdragsbeskrivning***.*

One could think of several possible approaches to set up the GOM to mesh process and this thesis intends to describe these alternatives and present an argument for pros and cons for each one of them in addition to a working process that has been tested on different types of geometries.

First, the process can be of a generic or context specific nature.

* Generic GOM2Mesh – E.g. taking any GOM geometry and create a solid mesh for analysis. This would be a flexible process but may be difficult to get robust.
* Context specific GOM2Mesh – E.g. The geometry is known and templates can be used to only adopt to changes around deviation points. This would take advantage of known geometry and reduce the area to be automatically meshed but may need some setup time for each type of component.
* Evaluate the quality of obtained mesh compared to original measurement data
* Secondly, you could have a process that goes direct from GOM to Mesh or via CAD.
* Direct GOM2Mesh – Create or adjust the mesh based on GOM data without a cad model. This could reduce the number of steps in the process but can be difficult to obtain the “correct” surface between “nodes”.
* GOM->CAD->Mesh – Create or adjust a CAD model based on GOM data and then create a mesh based on the CAD geometry. This could take advantage of advanced modelling techniques in the CAD system to smoothen and manipulate the geometry before mesh but can increase the number of steps and introduce possible errors in the process.

Thesis targets:

* Literature review
* Familiarization with methods and tools currently used within GKN Aerospace.
* Determine preferred approach(es) and present pros and cons to support the conclusion.
* Set up and demonstrate a working approach that efficiently creates a mesh suitable for non-conformance weld assessment.
* Document the results in a thesis Report. (English)
* Present the summery and conclusions for an audience at GKN Aerospace. (English)

# Qualifications/Experience/Skills

Recommended academic background: Mechanical engineering including courses in meshing techniques, CAD and programming.

Send CV and personal letter to Petter Andersson (Petter.andersson@gknaerospace.com)

**Function**: **Employee Type**: Intern/Co-op

**Advertising start date (External &Internal):** 2017-10-05

**Advertising end date (External & Internal):** 2018-01-15