

MEETING MINUTES

Topic: Concept Generation and Evaluation

Friday, February 22, 2018

12:00 pm – 3:00 pm

Minutes recorded by Jacob Barker

Attendees: Jacob Barker, Samm Metcalfe, Ashley Shumaker

Table 1. Record of meeting.

<p>12:00 pm to 1:30 pm</p>	<p>Concept Generation</p> <ul style="list-style-type: none"> • Reviewed previous results from in class 6-3-5 method • Discussed approaches for design options • Started new 6-3-5 <ul style="list-style-type: none"> ○ Everyone has done research on specific area: <ul style="list-style-type: none"> ○ Jacob-Turbine ○ Samm-Compressor ○ Ashley-Combustion chamber ○ Each person started 6-3-5 generating ideas for their specific designs <ul style="list-style-type: none"> ▪ Then passed designs around, let team members add on ▪ Answered questions and clarified options ○ Started generation designs by combining different solutions to each problem <ul style="list-style-type: none"> ▪ E.g. statorless compressor and turbine, two stages, preheated combustion, etc. ○ Came up with 15 possible combinations 	<p>EGR Internet Cafe</p>
<p>1:30 pm to 2:15 pm</p>	<p>Concept Evaluation: Pugh Chart</p> <ul style="list-style-type: none"> • Combined customer needs, engineering requirements, and additional factors to create evaluation criteria for Pugh chart <ul style="list-style-type: none"> ○ Removed unnecessary/unhelpful criteria <ul style="list-style-type: none"> ▪ e.g. user's manual, measure temperature and pressure at every state ▪ all designs should accomplish these so they don't help narrow selection choices ○ Selected simplest design as Datum <ul style="list-style-type: none"> ▪ Single stage compressor/turbine, constant hub and tip radius, statorless, no heating ▪ Evaluated all other concepts against this datum ○ Narrowed designs down to four finalists 	<p>EGR Internet Cafe</p>

2:15 pm to end	Concept Evaluation: Decision Matrix <ul style="list-style-type: none">• Used decision Matrix to select final design option• Weighted criteria from Pugh Chart from 0 to 1• Scored each of the four designs against each criteria from 0 to 100• Multiplied criteria weight by raw score and summed to find strongest design<ul style="list-style-type: none">○ Statorless, single-shaft, variable hub radius/constant tip radius, combustion chamber with preheat○ This may change as we research more on blade design<ul style="list-style-type: none">▪ Statorless design won for simplicity/construction feasibility, but may need to be swapped for stator design based on aerodynamic research• Meet Again Monday at 8 PM to finalize presentation and practice	EGR Internet Cafe
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