

Network Innovation Competition Full Submission Supplementary Answer Form

Tick if this answer is Confidential: ☐

Tick if this answer has been provided verbally: ☐

Project code:	NGGTGN01	Question Number	10
Question date	03 September 2013	Answer date	05 September 2013
Submission section question relates to	Section 4		
Topic	Criteria d		
Question	Rolls Royce seem to have developed and installed VIGV in gas pipeline applications; in an explosive environment. Also, one of the two Canada applications (in Alberta) was a retrofit to a Variable Speed unit (Frazer-Nash consultants' report p.33). In light of this, please explain how VECTOR is innovative, that is, how does the VECTOR project differ from the Alberta one?		
Notes on question			
Answer	<p><u>Rolls Royce reported that the Alberta installation was a two-position VIGV system retrofitted to a single shaft, fixed speed gas turbine. Process control was achieved using upstream suction throttling. The customer requested a method of process variation instead of the suction valve (see Frazer Nash Variable Envelope Compressor Report, page 33).</u></p> <p><u>A single shaft gas turbine is fixed speed because it cannot be operated efficiently away from its design point hence this type of gas turbine is usually used in power generation applications where speed variation is not required. Gas turbines for pipeline applications are two-shaft machines which allow stable and efficient speed variation down to 90% from 10% to 100% of their maximum speed varies. All gas turbine compressors on National Grid's fleet are two-shaft gas turbines. The Alberta gas turbine had VIGV installed to provide the single method of process variation to the fixed speed gas turbine instead of suction throttling which had been used previously.</u></p> <p>The main differences between the VECTOR project and the Alberta project</p>		

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	<p>are:</p> <p><u>The Alberta project is a retrofit VIGV system to a fixed speed machine.</u></p> <p>Alberta Project is a non-manually actuated VIGV system, VECTOR project will be ana <u>remotely</u> actuated system.</p> <p>The Alberta Project is a simple on or off system and in one plane of the compressor rotation- 0 degree and +30 degrees-; the VECTOR project wants <u>aims</u> to develop a multistage VIGV system that <u>allows continuous variation in the position of the VIGV system and which</u> can direct the flow in two planes (with and against the direction of compressor rotation) <u>to maximise the range of the envelope variation.</u></p> <p>To allow the Alberta VIGV system to be changed the compressor has to be <u>taken offline and vented</u>, the VECTOR project wants to be able to control the VIGV <u>and Speed Control</u> settings instantaneously <u>and stably and</u> while the compressor is online.</p>
Attachments	
Verbal Clarifications (Consultants)	

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