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KnightHawk's Intrabody Flow Diverter





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Background

- Transfer Line Heat Exchangers (TLE's) are used in the chemicals manufacturing facilities to rapidly cool the process gas after it is drawn from the furnace at very high temperatures, typically well above 1000 deg. F. The TLE is a shell and tube type heat exchanger and is typically larger in diameter than the process gas pipe.

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- Hot process gas enters the TLE through an inlet cone.
- Hot gas flows thru the tubesheet into many tubes to the exchanger outlet.
- Tubes are surrounded by boiler feed water on shell side.
- Process gas is cooled.
- Boiler feed water is heated and steam is produced.

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Current Problems with Inlet Cone

- Coking
- Jetting at the Tubesheet Center
- Tubesheet Erosion
- Corrosion on the backside of the tubesheet

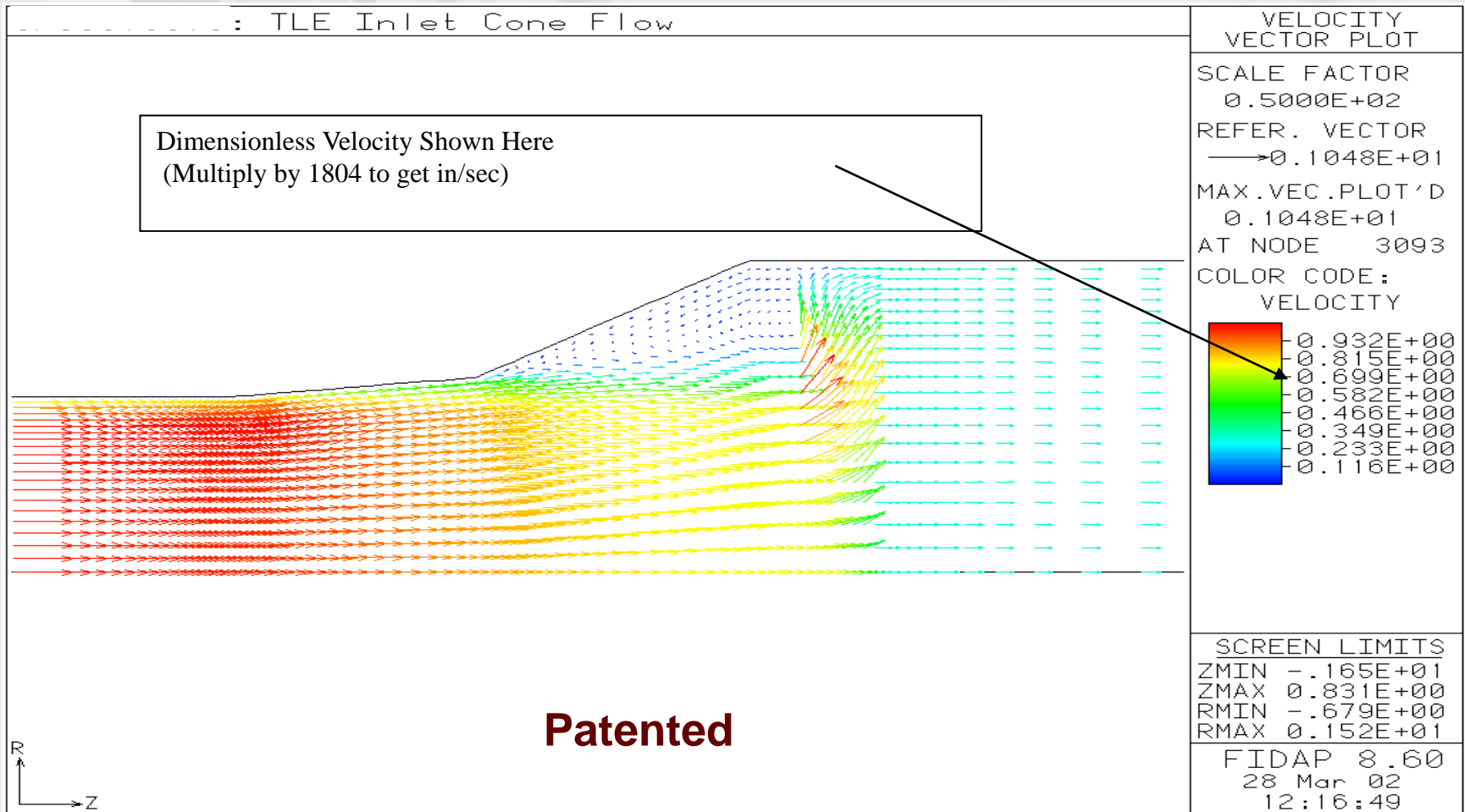
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- **Other companies have tried to solve the Jetting problems by inserting devices into the inlet cone to break up the flow.**
- **Coking problems were addressed by devising ways to periodically cleaning the tubesheet.**
- **Coatings on the tubesheet have also been tried.**
- **Most efforts were unsuccessful due to the high heat conditions destroying the coatings and equipment.**



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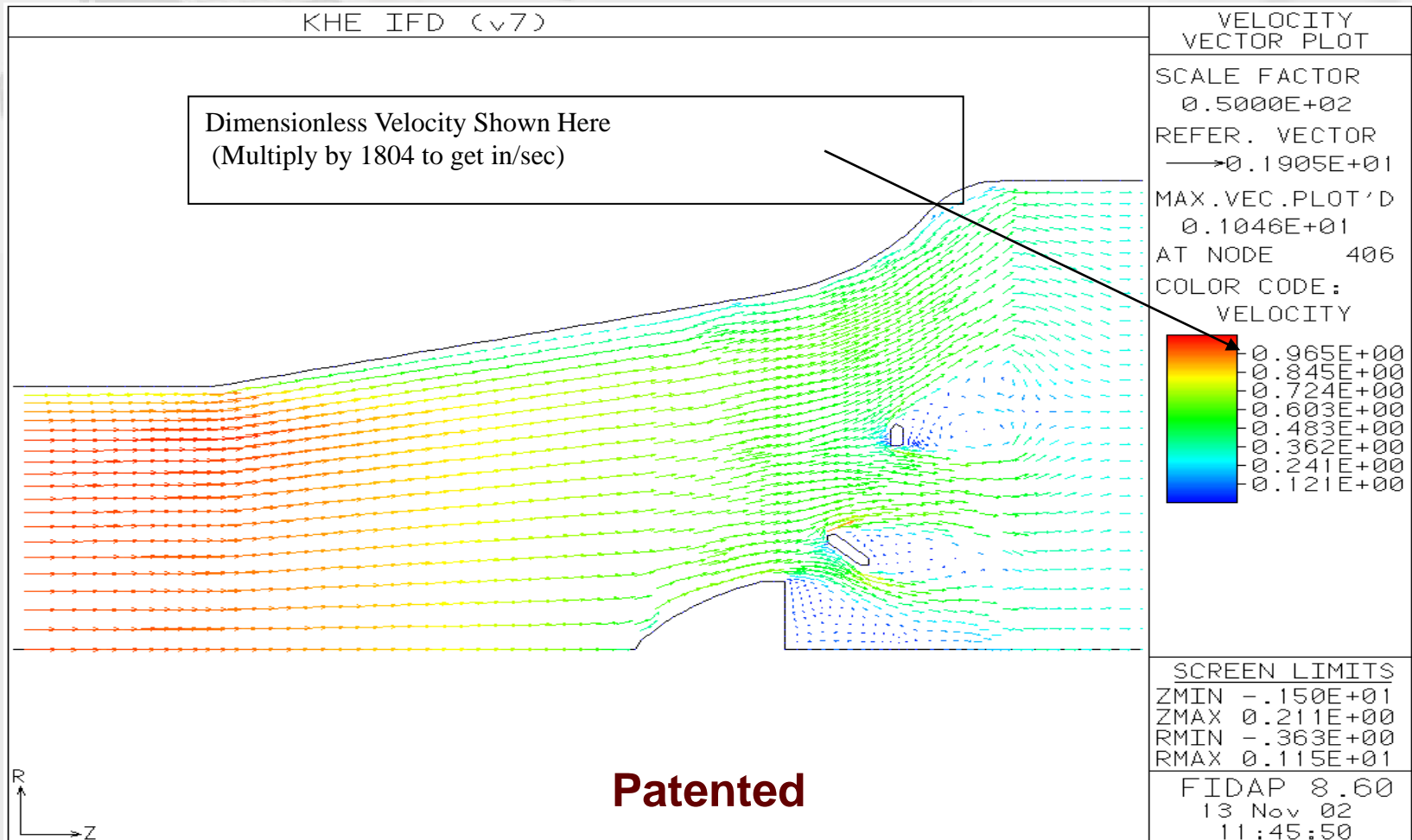
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- KHE developed a **patented** process for analyzing the process flow.
- We develop a custom solution for each set of application conditions.
- The solution
 - An optimally designed intra-body flow diverter (IFD) for your equipment and process design.
 - A Re-designed geometric shape of the refractory on the inlet cone wall to reduce the recirculation zones on the outer perimeters as much as possible.
 - Install a diverter with optimized geometries to achieve equal flow across the tube sheet as well as breaking up the center jetting of the flow.

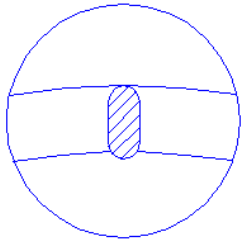
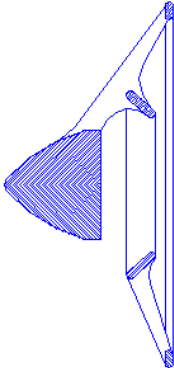
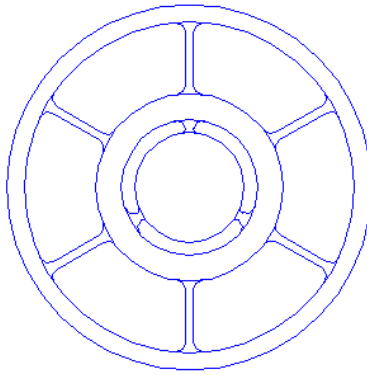
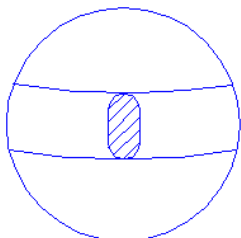




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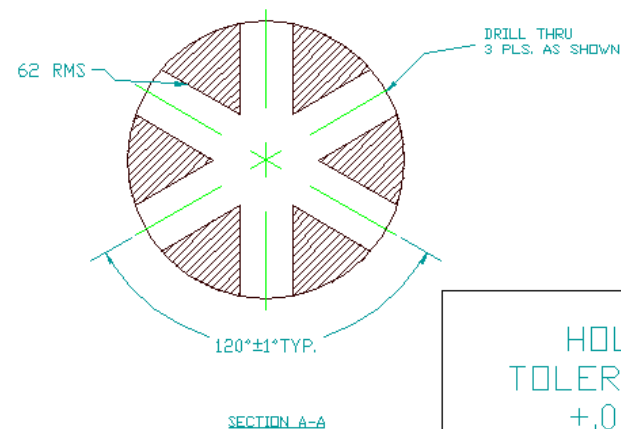
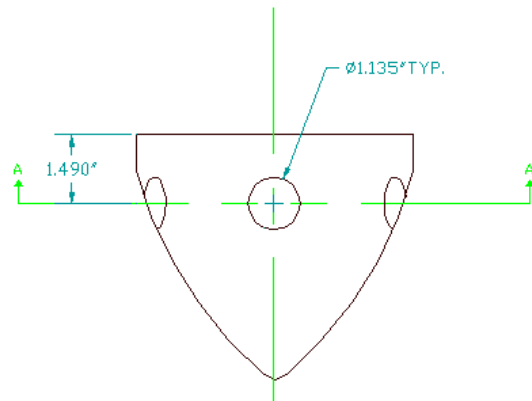
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				 Specialized Design, Pattern Analysis and Manufacturing of Static and Moving Components	
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				KIFD0010510	
				DRAWING #	
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INTRA-BODY-FLOW DIVERTER		DESCRIPTION			
REV.	DESCRIPTION	DRN.	CKD	APP	DATE
		 Specialized Design, Pattern Analysis and Manufacturing of Static and Moving Components			
				KHE0010510	
				PROJECT #	
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HOLE
TOLERANCE
+.010
-.000



*Specialists in Design, Failure
Analysis and Troubleshooting of
Radio and Retaining Equipment*

CLIENT

PROJECT #

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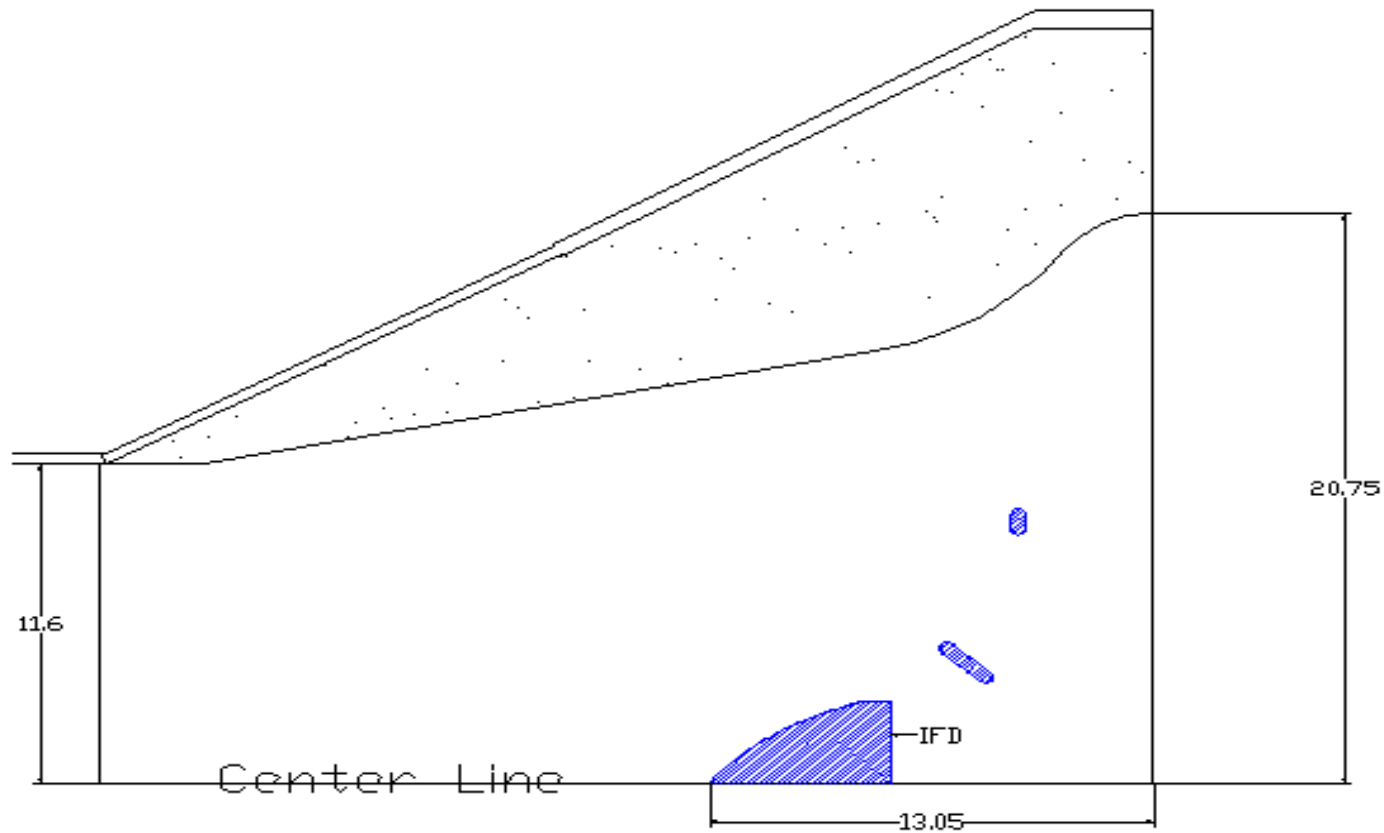
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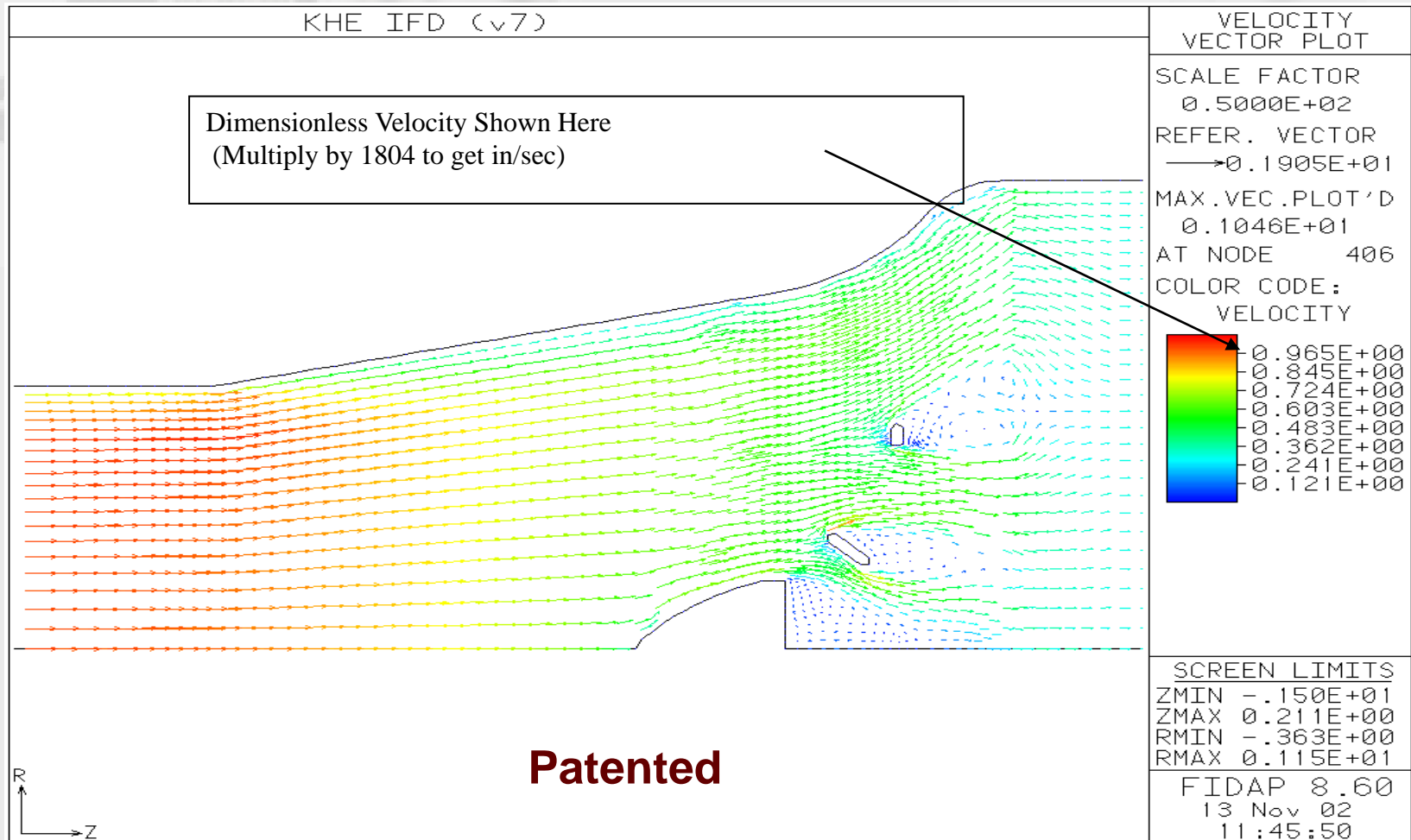
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