

# **REDESIGN OF FLOW DISTRIBUTION CHAMBER THROUGH SIMULATION**



# CONVENTIONAL DISTRIBUTION CHAMBER (WEIR TYPE)

# METHODOLOGY IN CFD

## PRE -PROCESSING

Geometry generation

Geometry refinement  
↓

Meshing

## PROCESSING

Problem  
Specification

Additional Models  
↓

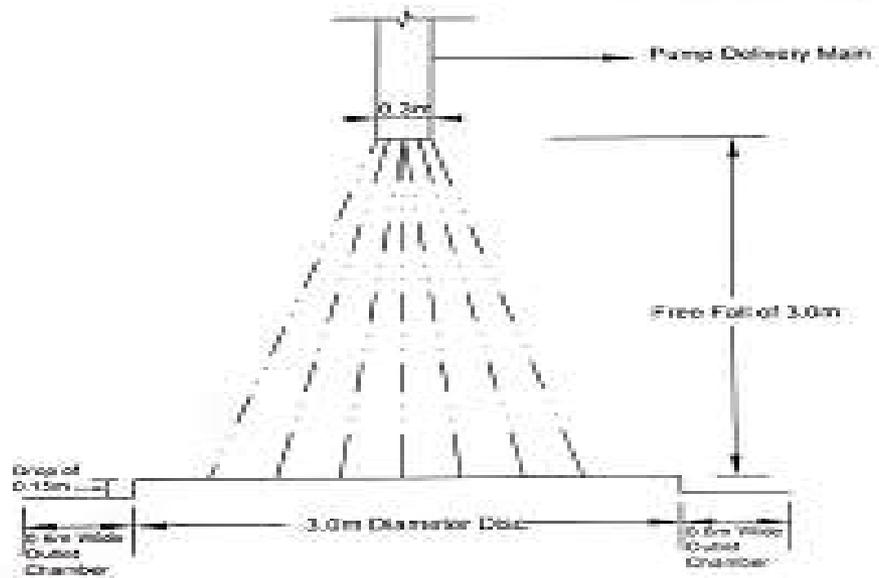
Numerical  
Computations

## POST-PROCESSING

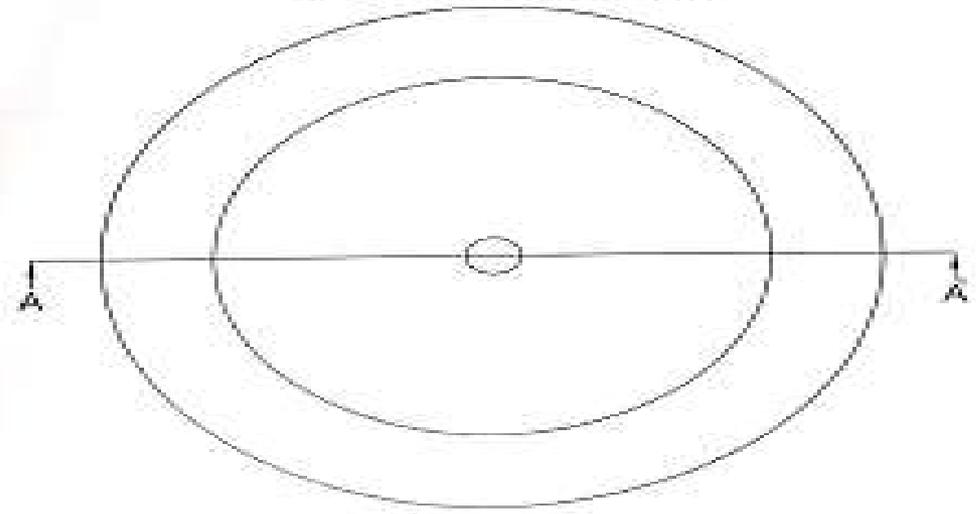
Vector and Contour  
Data

Evaluation of Values  
↓

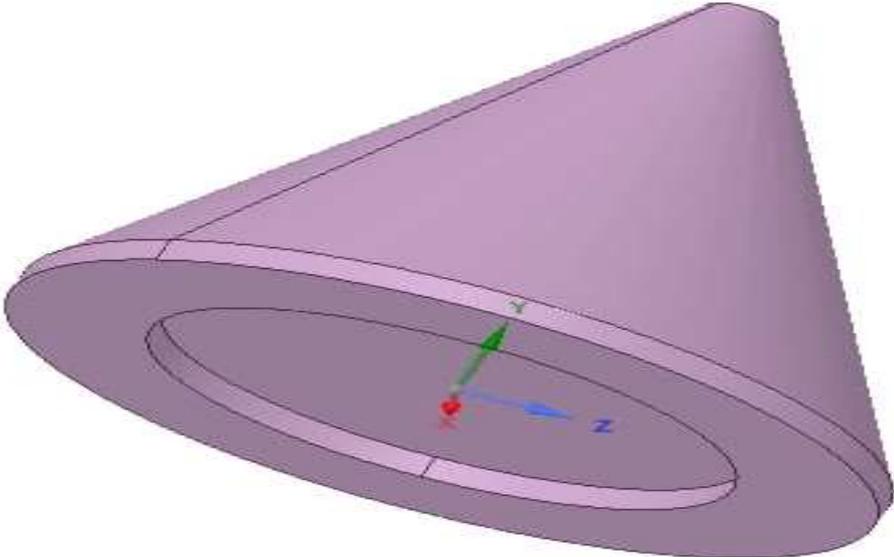
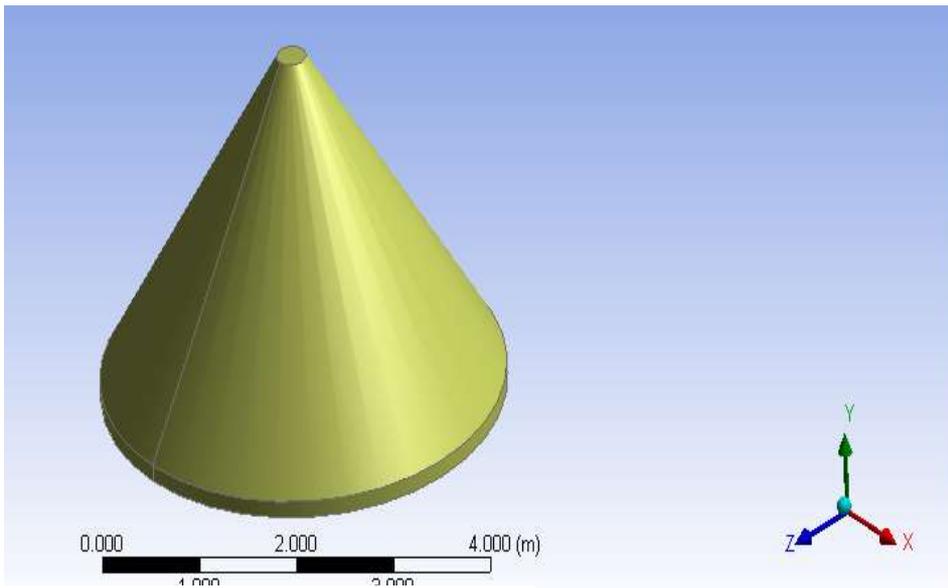
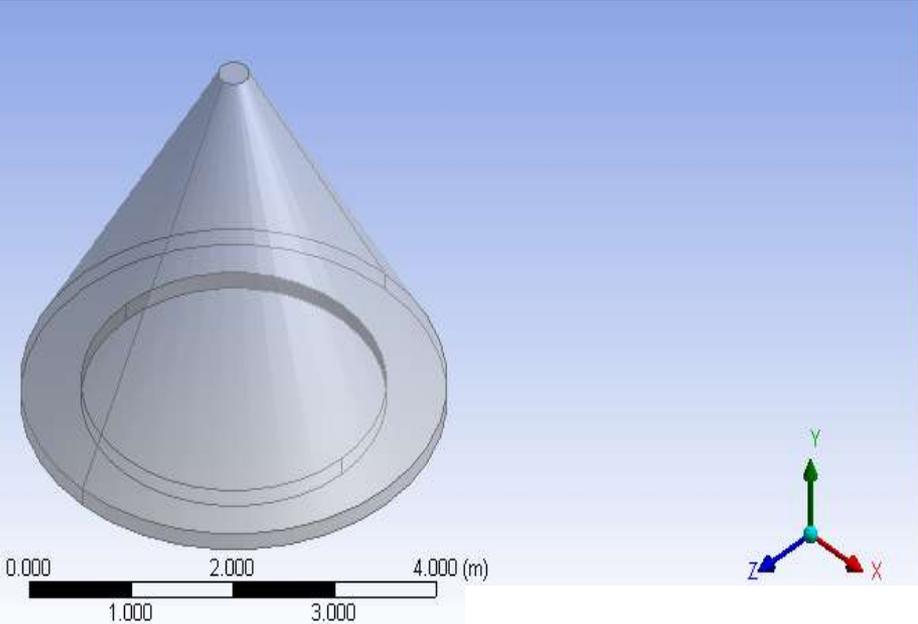
Report Generations



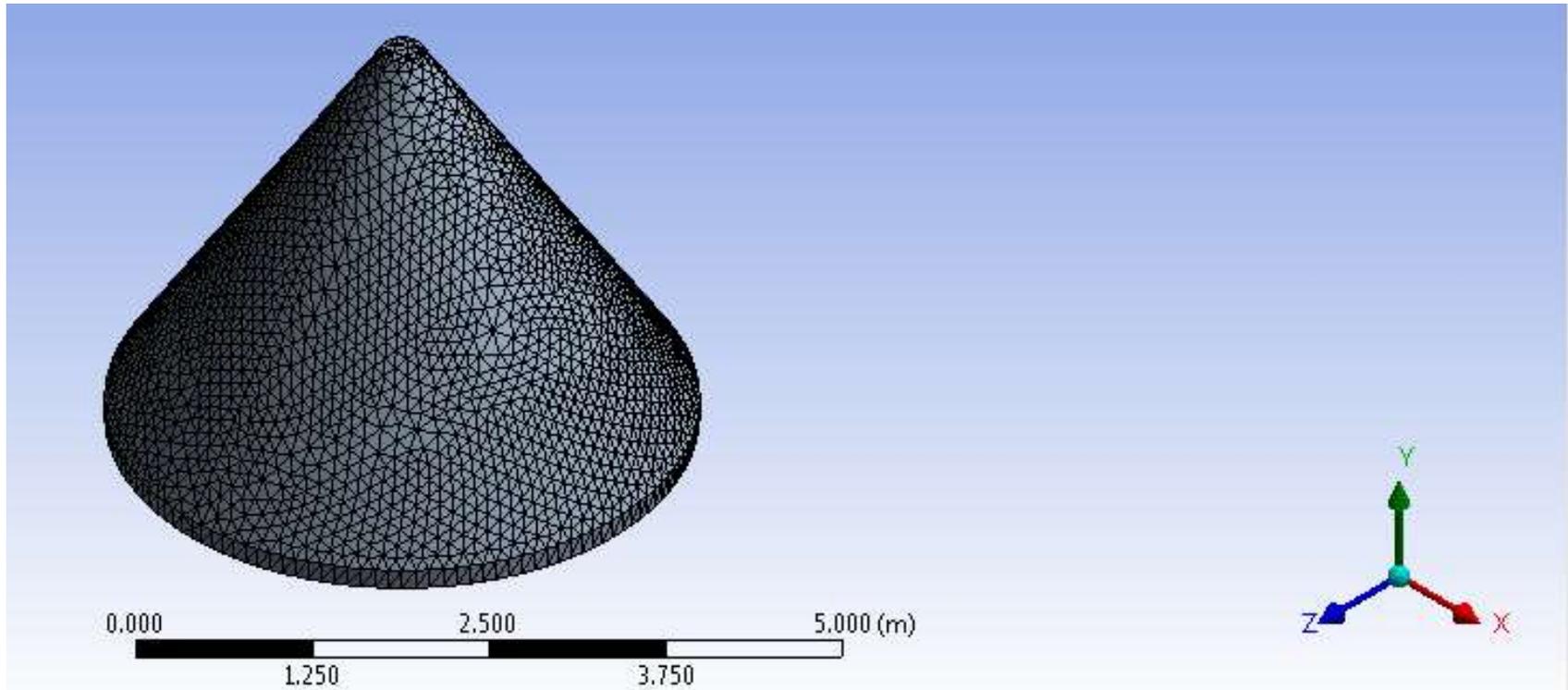
Sectional Elevation at A A'



# GEOMETRY OF CIRCULAR DISTRIBUTION CHAMBER

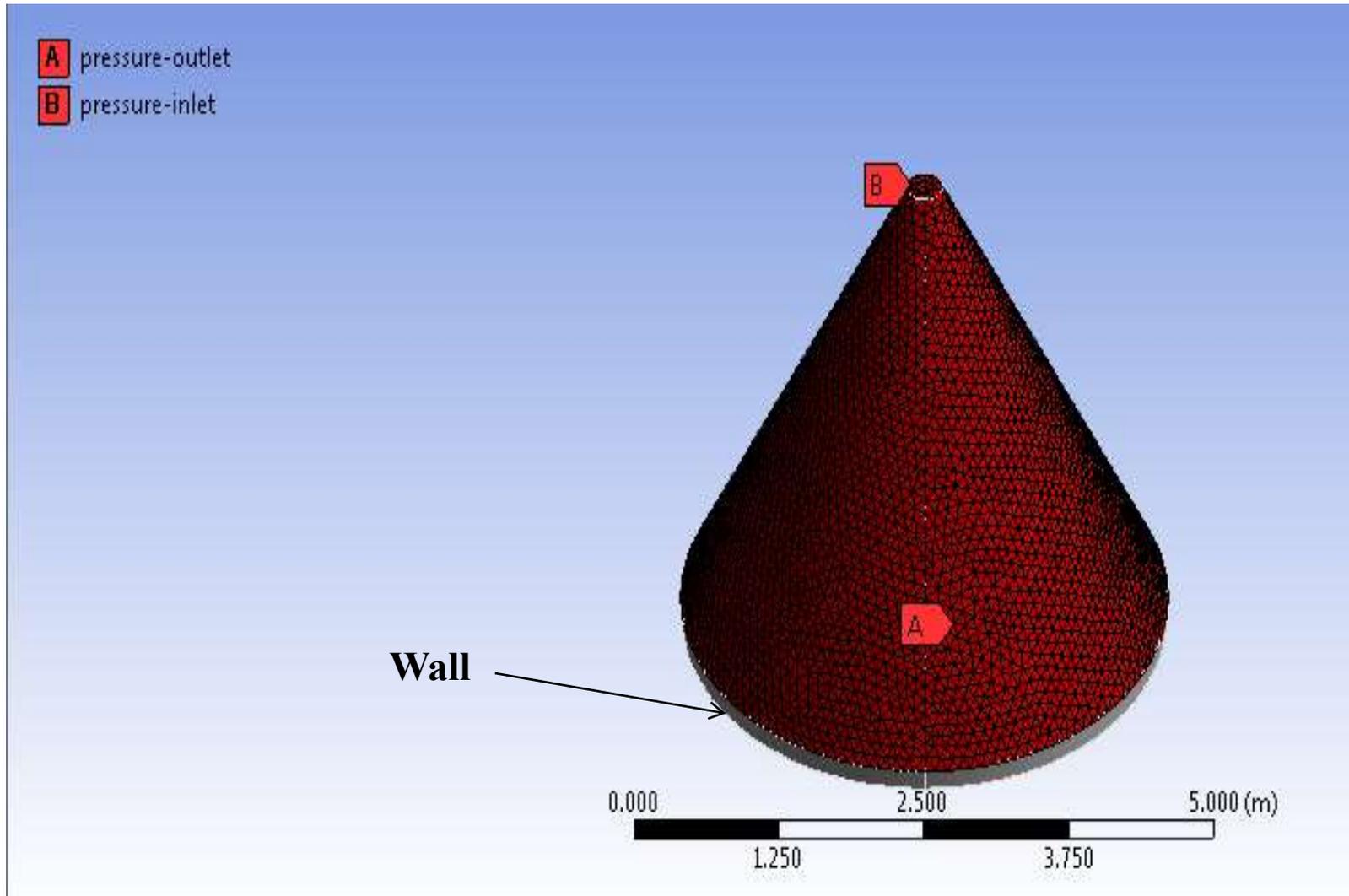


# MESHING OF CIRCULAR CHAMBER

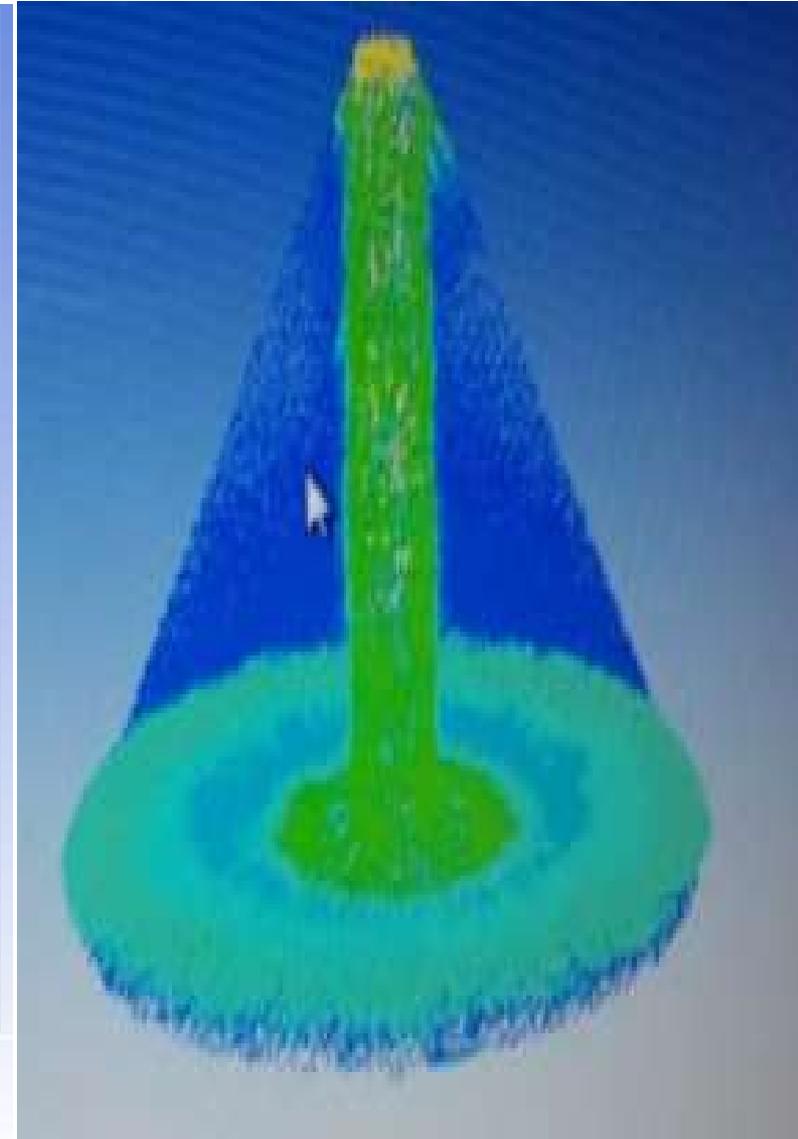
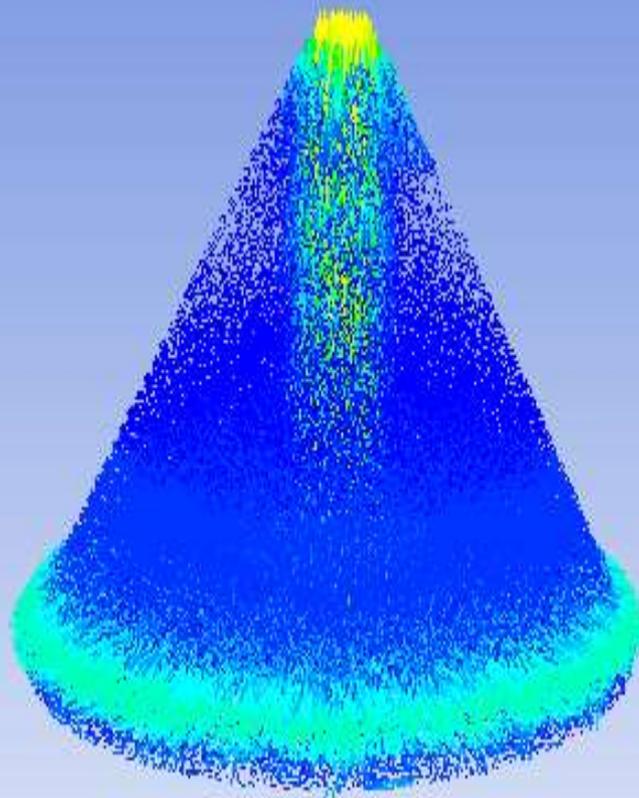
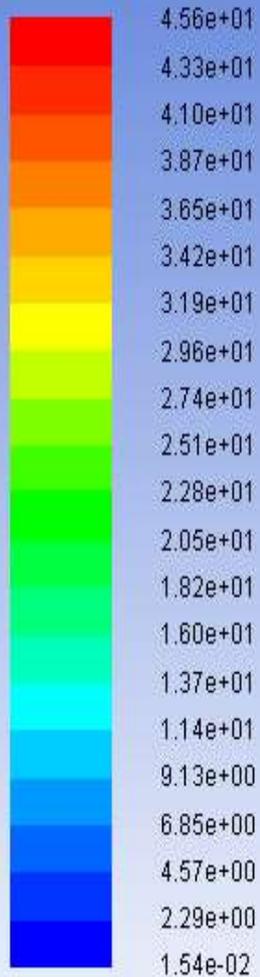


<b>DESCRIPTIONS OF THE ITEM</b>	<b>2.5m DIAMETER DISC</b>	<b>3.0m DIAMETER DISC</b>	<b>3.5m DIAMETER DISC</b>
<b>NODES</b>	<b>1,53,869</b>	<b>1,87,793</b>	<b>2,89,464</b>
<b>ELEMENTS</b>	<b>1,23,566</b>	<b>1, 67,947</b>	<b>2,65,879</b>

# BOUNDARY CONDITIONS OF CIRCULAR CHAMBER

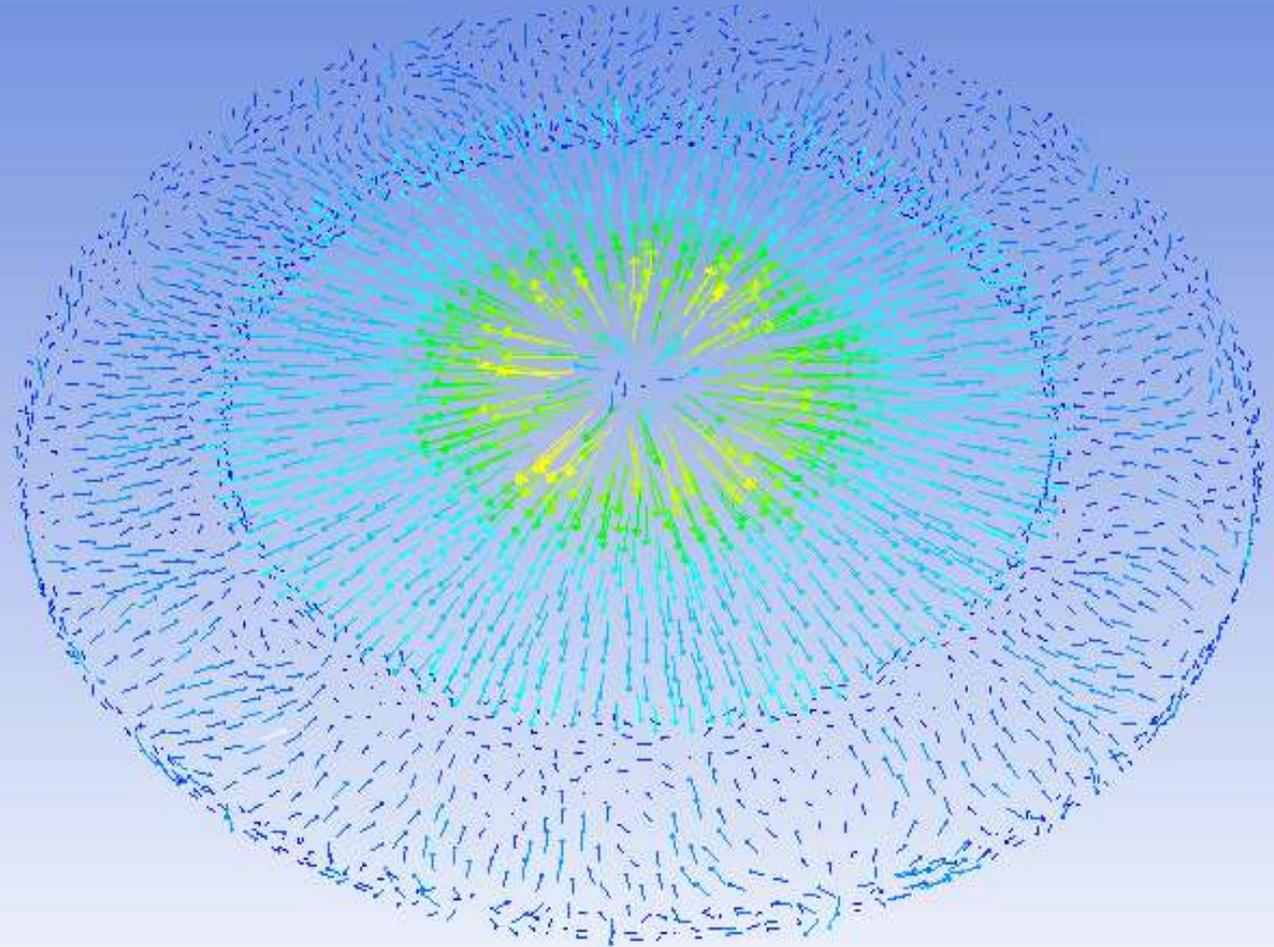
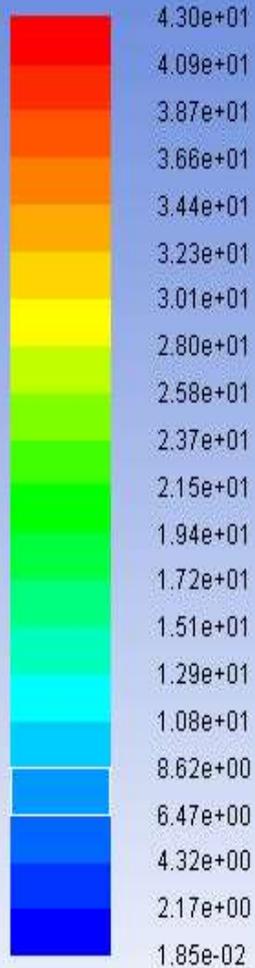


# FLOW PROFILE OVER 2.5 M DIAMETER DISC AT A PRESSURE HEAD OF 45.0 M



Velocity Vectors Colored By Velocity Magnitude (mixture) (m/s) (Time=1.3100e-01)

# VELOCITY VECTORS FOR 45.0 M PRESSURE HEAD OVER 2.5 M DISC DIAMETER



Velocity Vectors Colored By Velocity Magnitude (mixture) (m/s) (Time=1.3000e-01)

# COMPARATIVE RESULTS OF ANALYSIS

<b>Disc size (m)</b>	<b>FLOW VELOCITY IN THE OUTLET CHANNEL (m/s)</b>				
	<b>Pressure head (45.0m)</b>	<b>Pressure head (15.0m)</b>	<b>Pressure head (7.5m)</b>	<b>Pressure head (5.0m)</b>	<b>Pressure head (4.0m)</b>
<b>3.0</b>	<b>5.52</b>	<b>2.635</b>	<b>1.955</b>	<b>1.655</b>	<b>1.46</b>
<b>3.5</b>	<b>4.60</b>	<b>3.365</b>	<b>2.220</b>	<b>3.29</b>	<b>1.40</b>
<b>2.5</b>	<b>5.71</b>	<b>3.405</b>	<b>2.175</b>	<b>1.56</b>	<b>1.26</b>

**Design Procedure to facilitate the  
Practicing Engineers  
has been evolved.**

**However, as it had been submitted for a  
PATENT it is not disclosed over here.**

# CONCLUSIONS

- From the present investigation, it is ascertained that, the simulation models are helpful in forecasting possible flow scenarios even before the execution of the project.
- Certainly, these inputs can be made use of to incorporate appropriate changes in the system either in the planning and/or design stages of the project, even without physical modelling.
- In simulation analysis, the modeler can examine a wide variety of possible situations to decide whether the output is sensible or not.
- Simulation models also help to identify the physical and institutional relationships and interactions that are esoteric and lead to needed research for the benefit of the society.



**THANKS FOR YOUR  
PATIENT LISTENING  
&  
OPEN FOR DISCUSSION**

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