



# NCSX Project Meeting

## Access Issues

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July 12-13 2000



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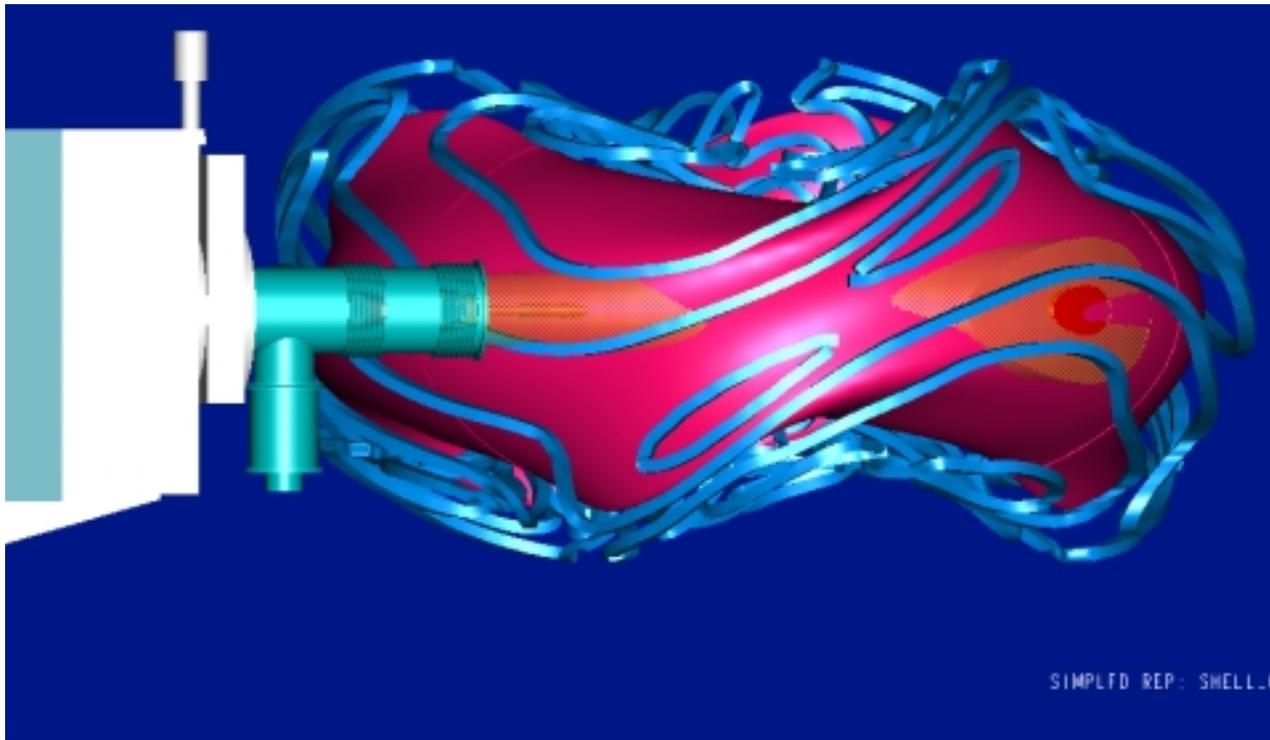
## Agenda

- L = 3 NB and Diagnostic Access
- NB Access for Modular Coil Arrangement (c82/0424)
- NB Access for Modular Coil Arrangement (ii75)



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## L = 3 NB ACCESS

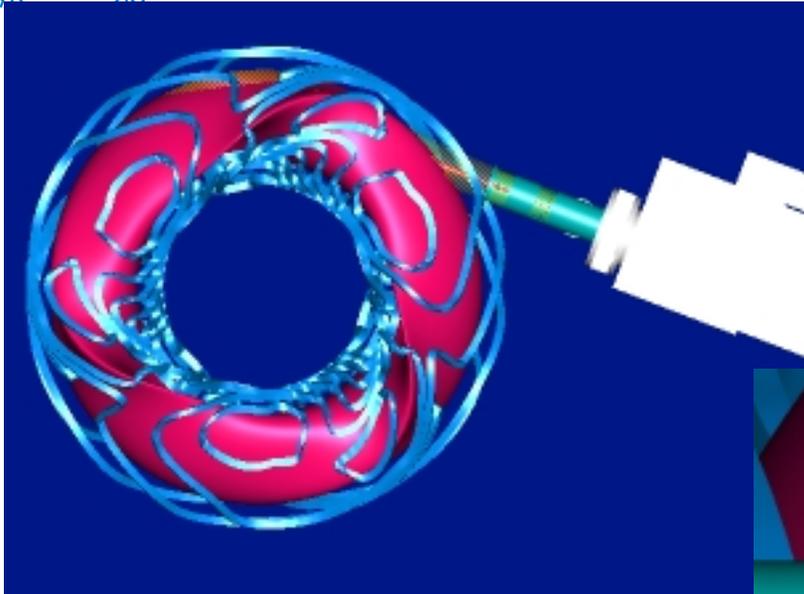


Several locations were considered for positioning the NBs.

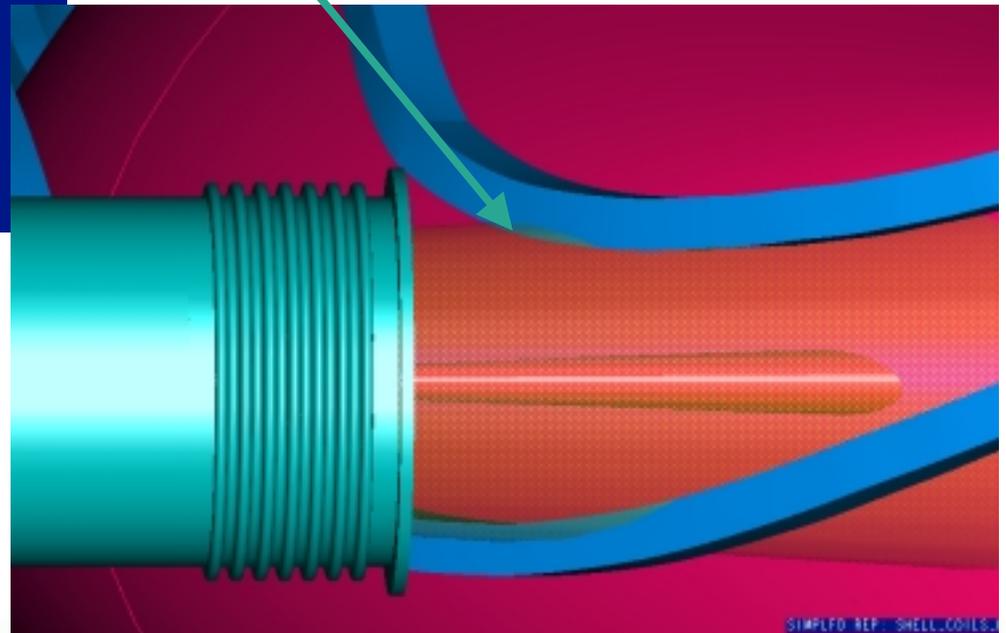
Each position on the midplane presented problems.



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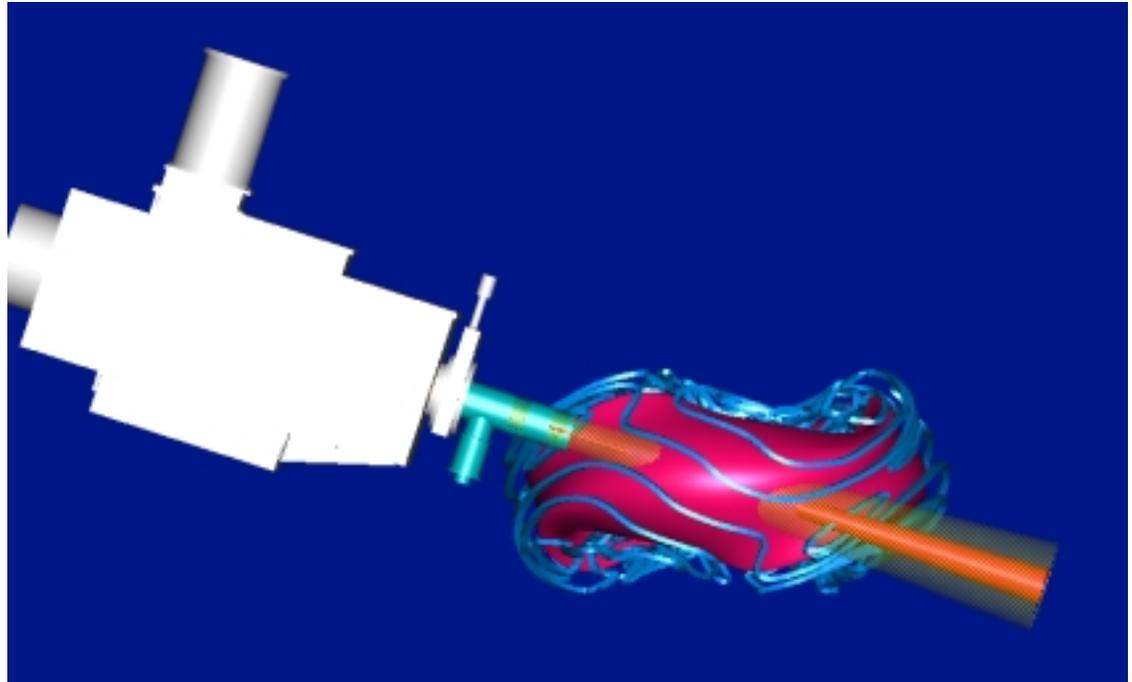
The NB interfered with the saddle coils in every location along the midplane.





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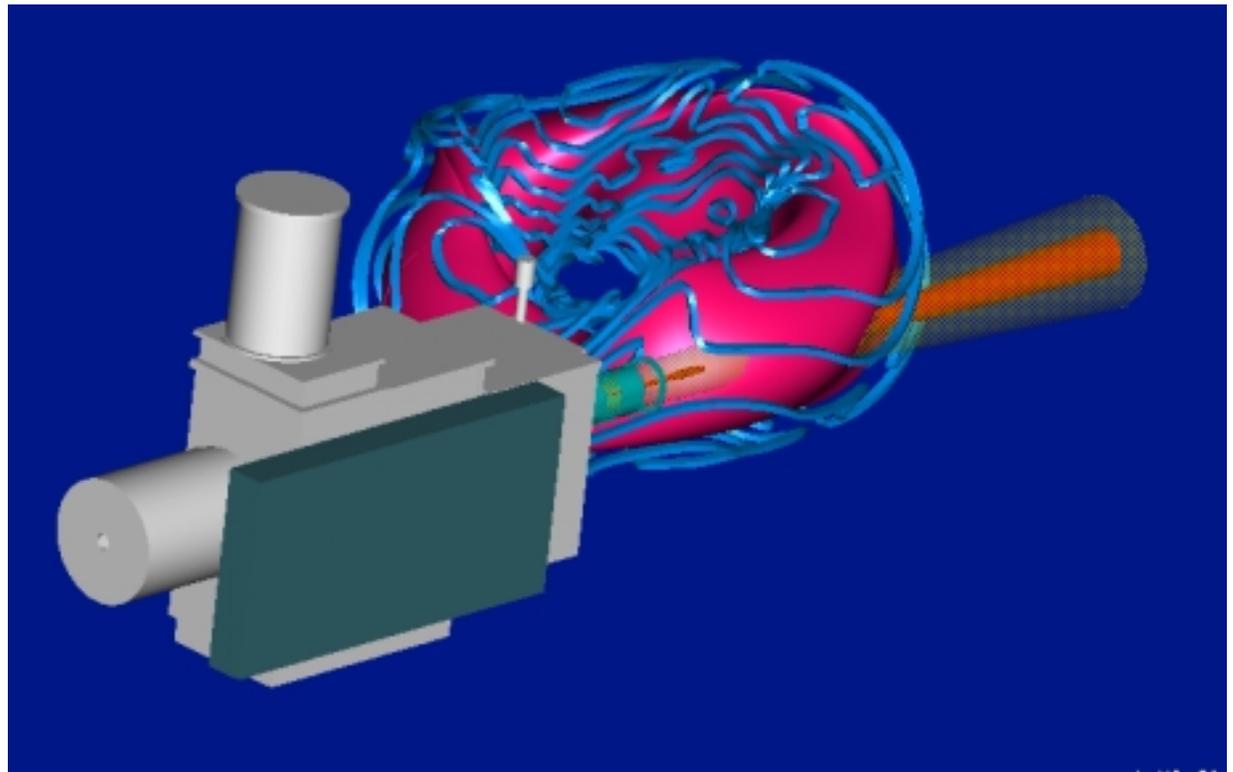
One location that appears to clear all of the coils is located at an angle to the midplane.





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A more detailed study may reveal other locations that could be used for NBs.





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**L = 3**

The saddle coils for the  $L = 3$  did not provide room for 3 large ports as shown for all previous configurations.

A shotgun approach was taken to add as many ports as practical for diagnostics.

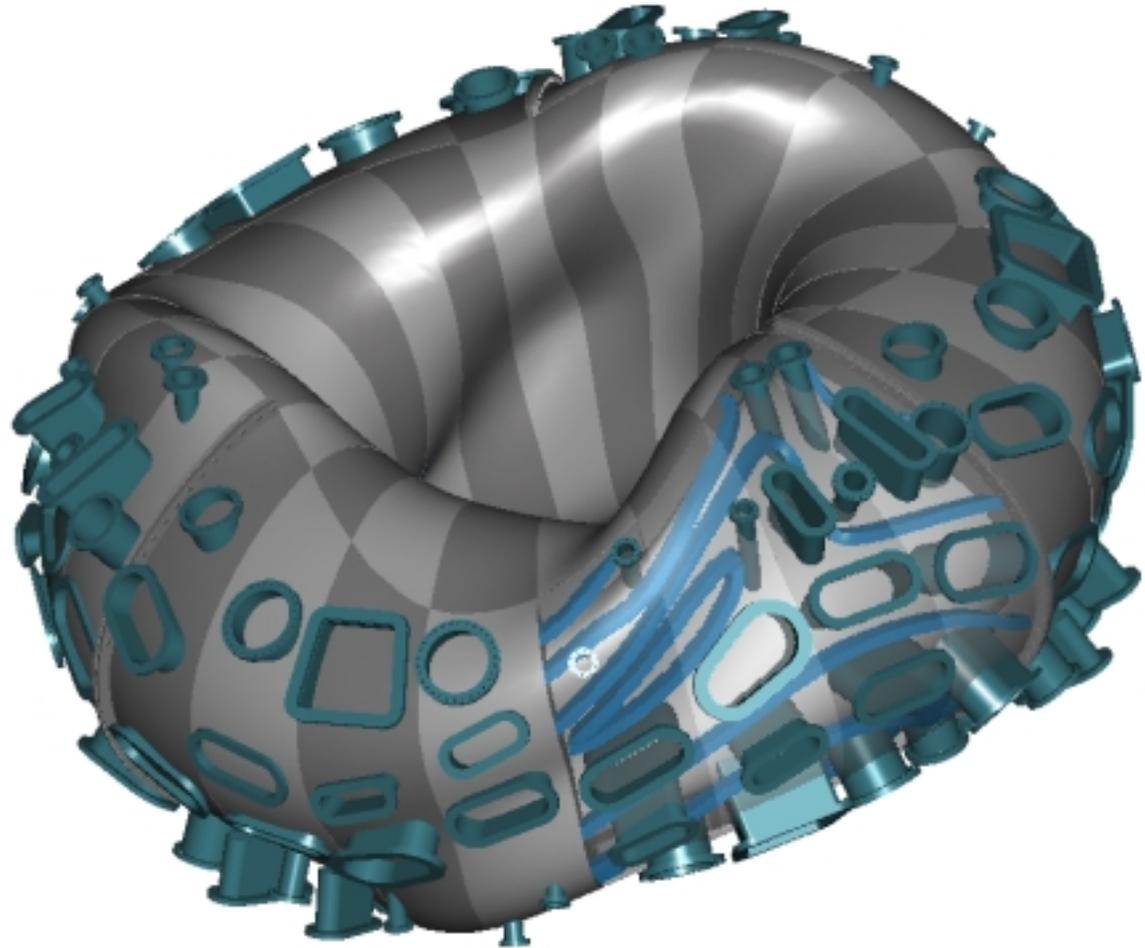




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L eq 3

<b>No of ports</b>	<b>126</b>
18	4 5/8 Dia.
18	6 3/4 Dia.
18	10 Dia.
6	13 Dia.
12	3 3/4 Dia. X 8 Long
6	3 3/4 Dia. X 12 Long
•	5 3/4 Dia. X 10 Long
6	7 3/4 Dia. X 8 Long
6	7 3/4 Dia. X 10 Long
6	9 Dia. X 10 Long
6	8 3/4 Dia. – 6 3/4 Dia. X 9 L
6	13.7 x 10.5 x 12





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## Access Summary for $L = 3$

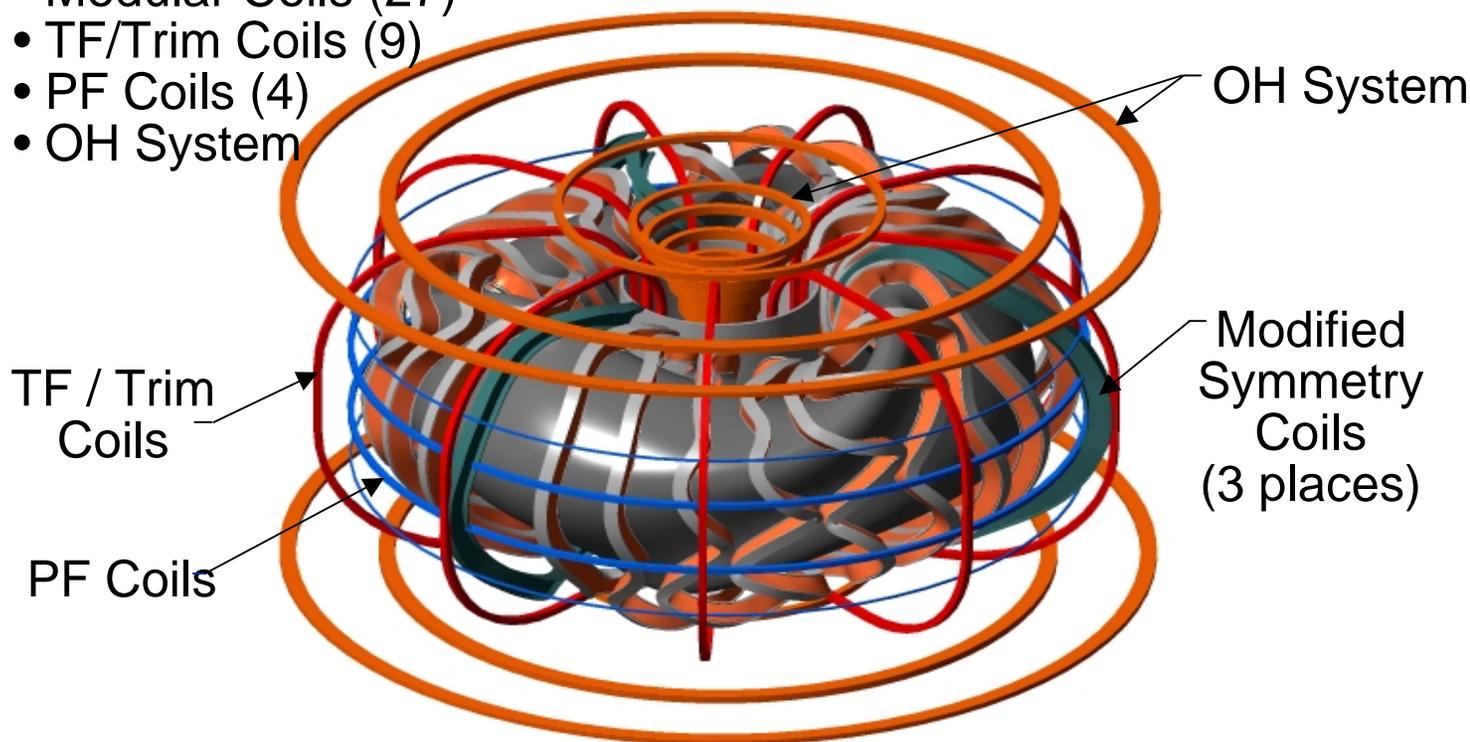
- Access for NBs presented several problems for positioning along the midplane. If locating the NBs off midplane is allowed this could allow more flexibility.
- $L = 3$  appears to have a large number of ports with openings that would compliment most diagnostics.
- However, I was unable to find a location that would accommodate the RF antennas (240 mm [9.4 in] wide by 440 mm [17.3 in] tall).
- A detail review for many of the diagnostics has not been done for  $L = 3$ .
- If  $L = 3$  is the configuration of choice a more detail study will be made.



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## Modular Coil Arrangement (C82/0424)

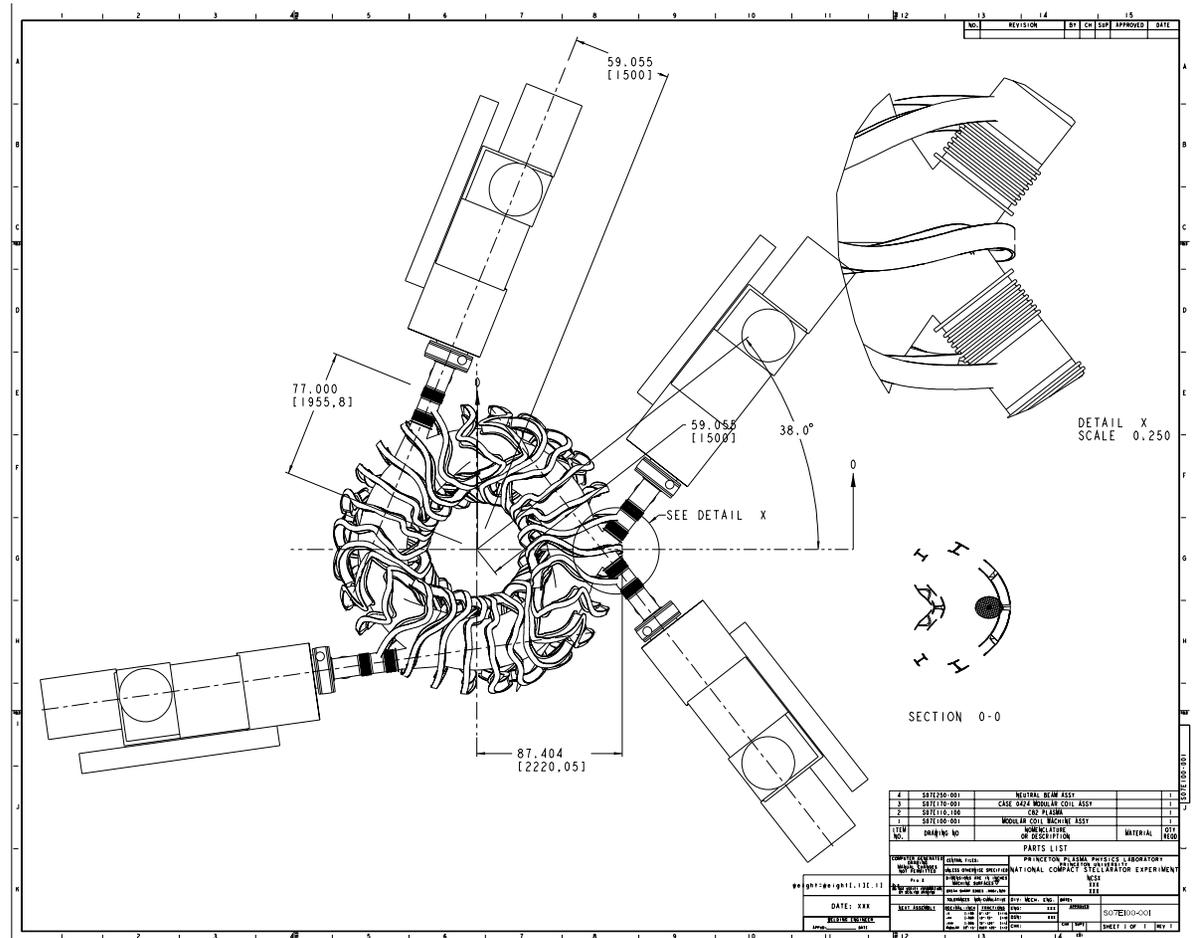
- Modular Coils (27)
- TF/Trim Coils (9)
- PF Coils (4)
- OH System





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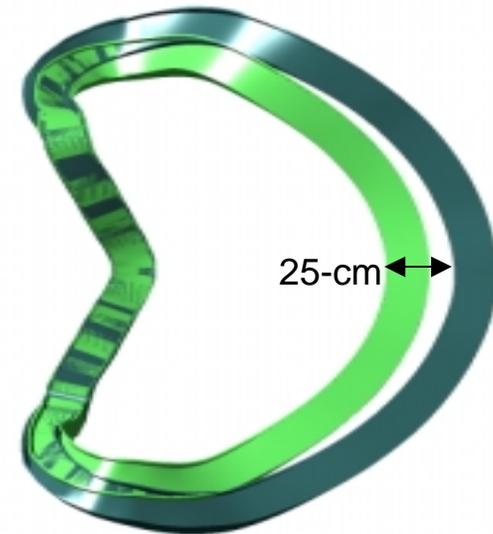
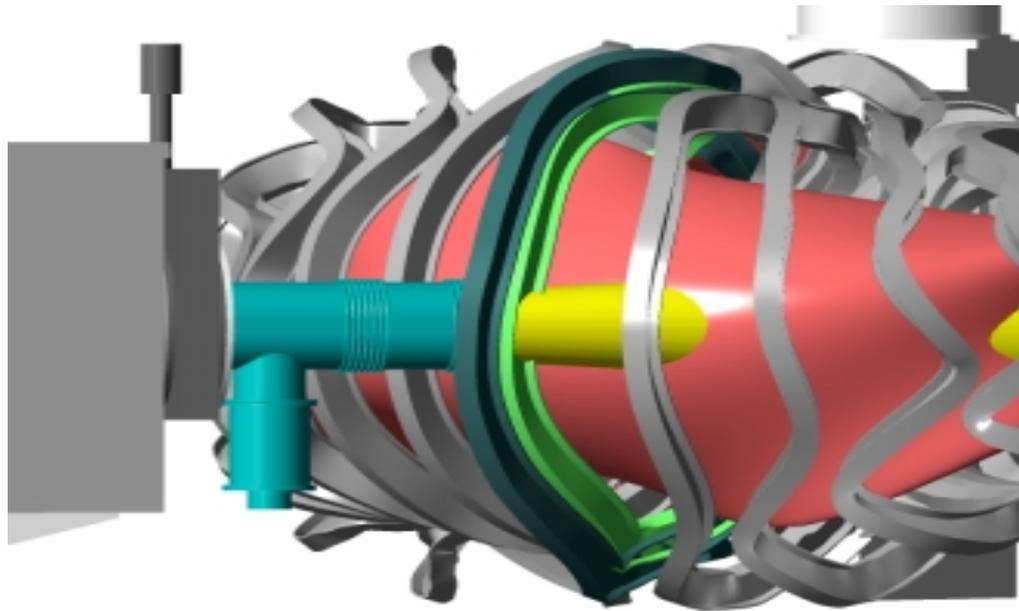
## Modular Coils with NB - Std Config





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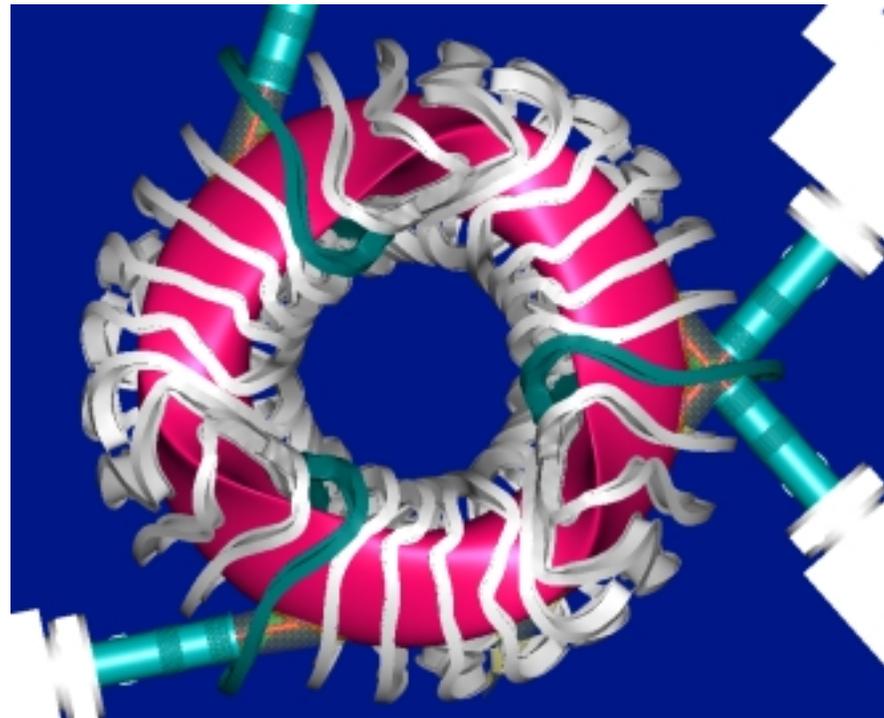
## Coil #5 Modified for NB Access





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## Modular Coils with Modified Configuration. Plan View



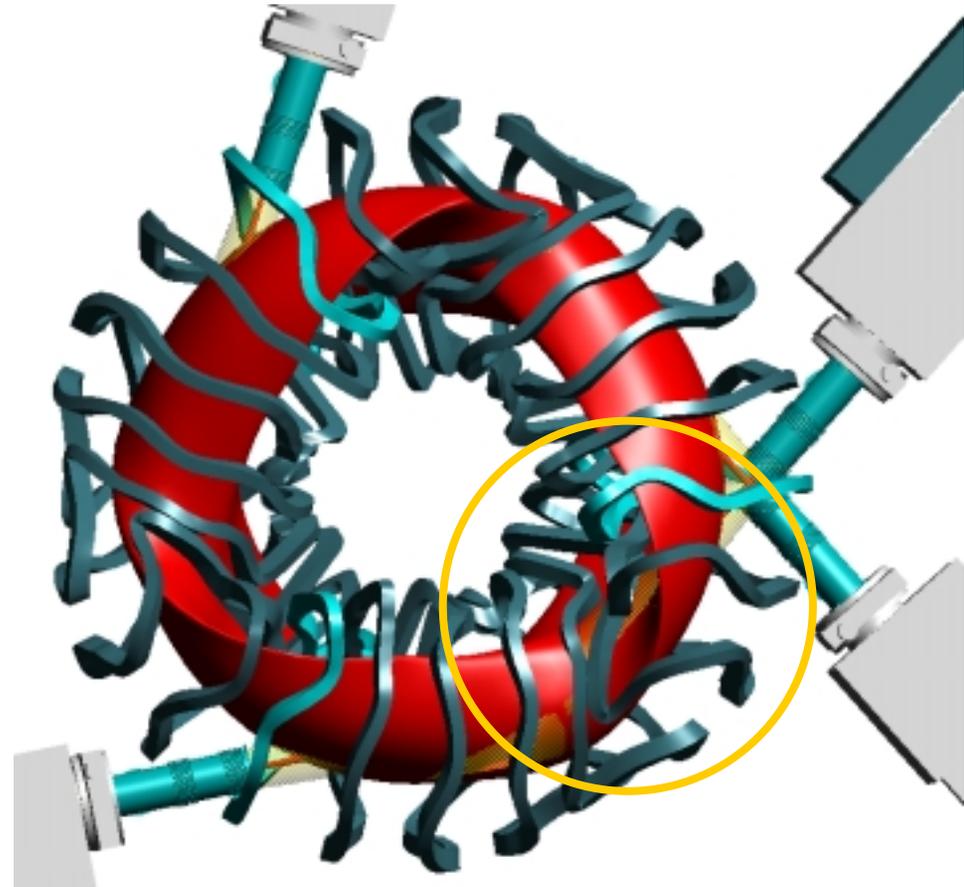


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ii75

The NB arrangement shown to the right appears to fit between the coils of ii75.

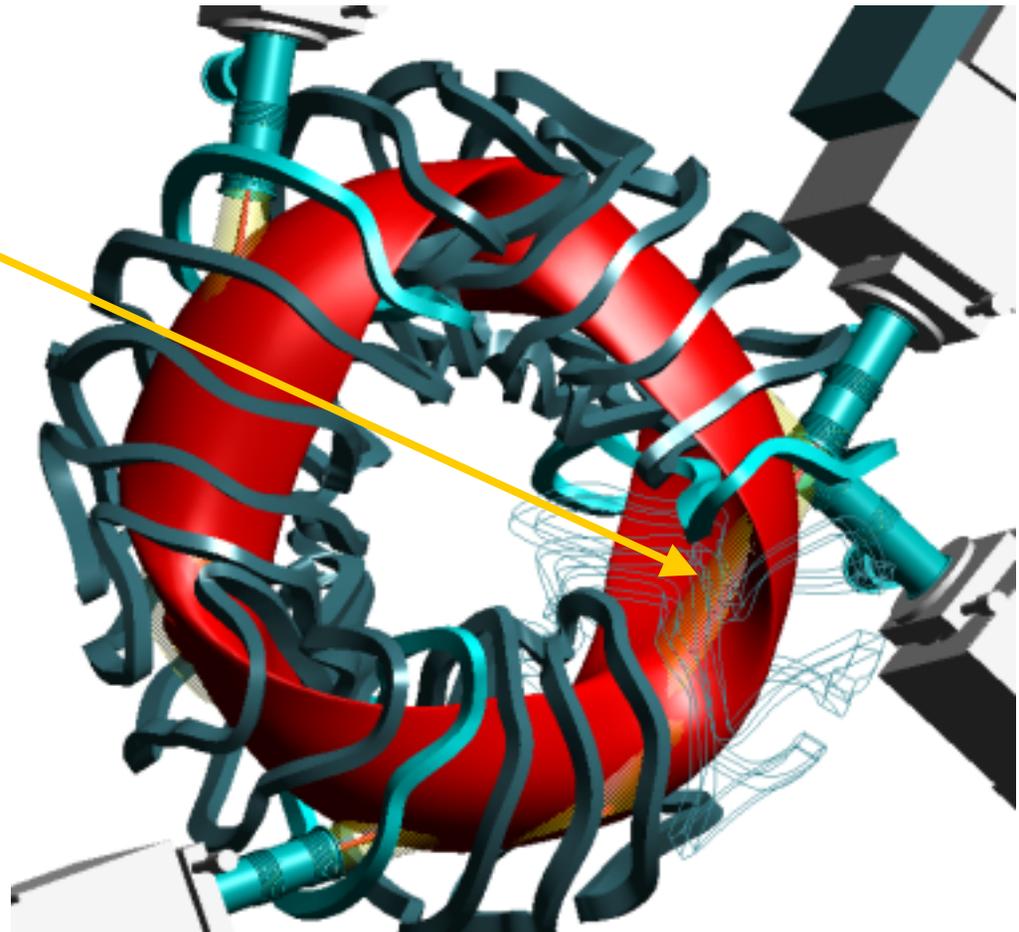
The circled area, however, indicates that the beam penetrates the inner wall of the plasma. This is shown in the next slide.





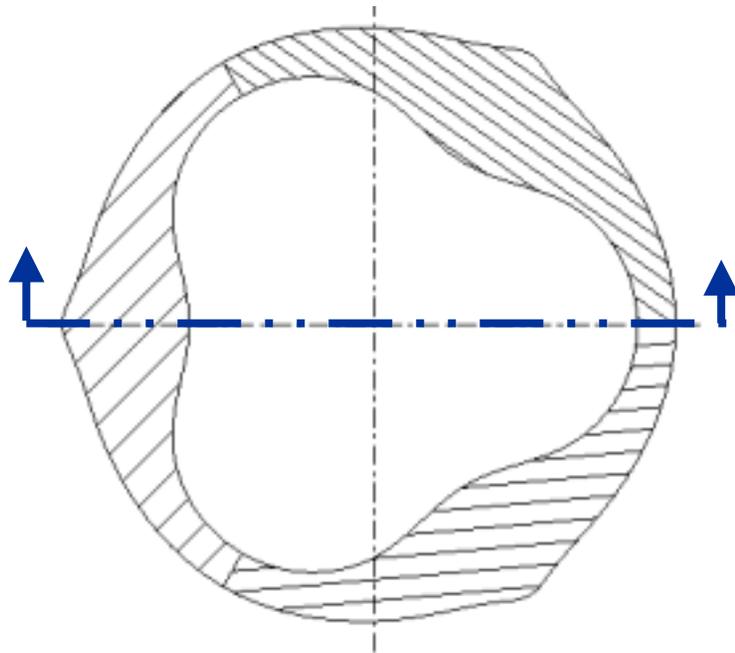
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Notice the beam penetrates the inside wall of the plasma soon after it enters.



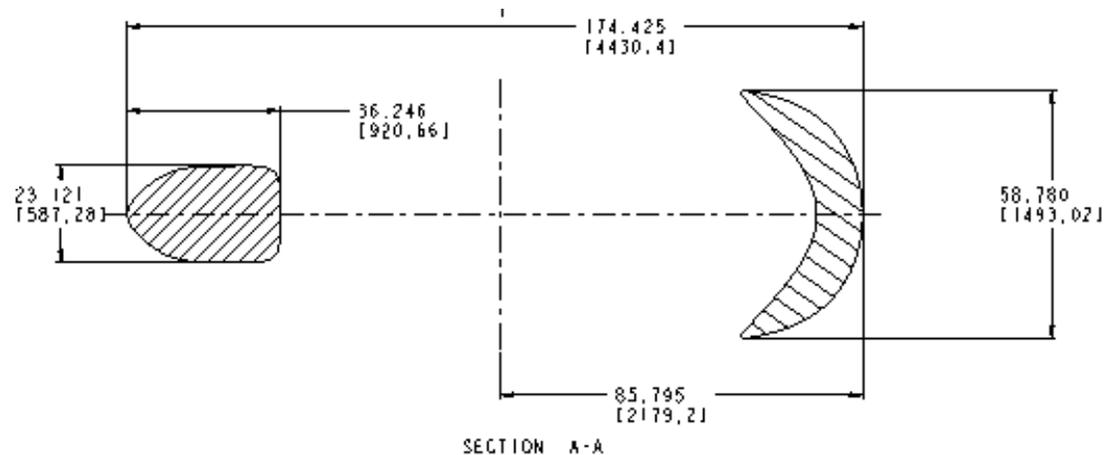


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ii 75

- As you move around the plasma the cross section of the plasma changes very quickly.
- This creates a problem for locating the NB at a location that does not penetrate the inside diameter of the plasma.



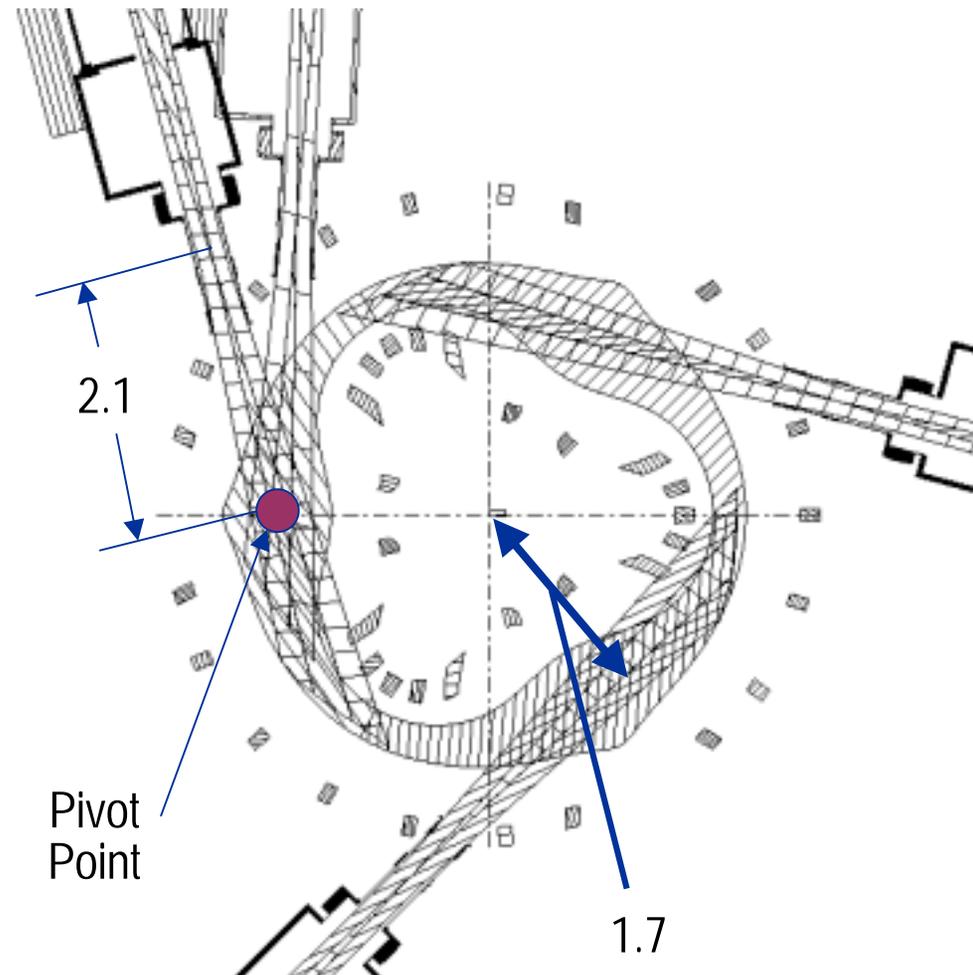


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An alternative positioning technique was used to position the NB's for ii75

The coils were located at a radius of 1.7 meters. The beams were pivoted about this point until they fit between the coils.

The NB's were also pushed away from the plasma to ~2.1 m





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## Access summary for ii75 Neutral Beams

- There appears to be room around the modular coils for ii75 to place 4 NBs.
- All of the issues for the NB such as room for pumping and armor for the vessel have not been addressed.
- We have learned to look carefully at different locations along the plasma to make sure the beam is contained in the plasma.
- Alternate positions for placing the NB's are being explored if the beams can not be placed tangent to the major radius.
- If ii75 is the selected configuration a more detail study will be made.