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# PROBLEM 13-7N QUESTION

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## Two Phase Flow Pressure Drop Calculation In BWR

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Consider a hypothetical BWR fuel assembly with following characteristics: All coolant channels are identical and all fuel rods are operating at the same uniform axial heat flux of  $0.8 \text{ MW/m}^2$ .

Calculate the friction pressure drop across the fuel assembly assuming the HEM condition are valid.

DATA:

*Operating Conditions:*

Subchannel coolant mass flow rate	=	0.199815 kg/sec
Reactor coolant pressure	=	6.89 MPa
Inlet water temperature	=	276.7°C
Density of saturated liquid	=	741.65 kg/m <sup>3</sup>
Density of saturated vapor	=	35.93 kg/m <sup>3</sup>
Enthalpy of saturated liquid	=	1260.4 kJ/kg
Enthalpy of saturated vapor	=	2770.8 kJ/kg
Slip ratio from Bankoff's correlation		

*Geometry:*

Pitch	=	16.2 mm
Pin Diameter	=	12.27 mm
Active fuel length	=	3.6576 m
Number of fuel rods	=	54