



Power Engineering



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The Power Engineering Profession and its
Personnel Future



Introduction

- A study of the membership in the Power Engineering Profession suggests that some **serious challenges** are emerging in the profession which will affect the ongoing availability of Operating (Power) Engineers.
- If current trends continue, the availability of Operating (Power) Engineers will reduce, with the result that future plant safety may be effected if the professions membership challenge is not rectified.

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Our Historic Progression

- From the late 1800's when the profession of Power Engineering was first introduced by the requirements of safety Regulation, the profession has played an essential part in the safe development of Ontario industry and its social support services.

The foundation of the Power Engineering Profession is its certified Engineers and Operators.

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What's the Problem ?

- If the Power Engineering Profession is so important to Ontario, how can there be a problem in being a member?

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2010 Membership Breakdown by Class

- Out of the total 775 First Class Engineers, only 12 (2%) are below the age of 40. (Average age 58)
- Out of the total 2383 Second Class Engineers, only 112 (5%) are below the age of 40. (Average age 52)
- Out of the total 3226 Third Class Engineers, only 301 (9%) are below the age of 40. (Average age 47)
- Out of the total 3489 Fourth Class Engineers, only 428 (12%) are below the age of 40. (Average age 45).
- With an average age of 48, Compressor, Refrigeration B and A Class Operators present a similar concern.

Total Number of Engineers (Average age – 51)	9872
Total Number of Operators (Average age – 48)	3200
Total	13072

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Development and Progression of Operating (Power) Engineers

- It is clear that the class level of the Engineer is correlated with their age.
- This correlation can be partially explained by the amount of time it takes to complete training and certification.
- It is important to project future membership trends in the profession in order to determine whether or not the number of Engineers and their educational profile will be sufficient to service the needs of industry.

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What is the current situation ?

Trends 2010

- The data strongly suggest that less young individuals are choosing to become Operating (Power) Engineers.
- There are only 320 Fourth Class Engineers under the age of 30, as opposed to 464 between 30 – 40 and 1108 between 40 – 50. There is limited upward mobility.
- The Fourth Class figure is particularly alarming because of the limited number entering the profession and progressing to higher certification.
- The likely cause is a lack of interest or understanding of the Power Engineering Profession and the related industry and engineering in general.
- This is a trend which is effecting most engineering professions.

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What has TSSA done to assist in the correction of these concerns ?

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TSSA Approved Training Colleges

- Confederation College – Thunder Bay – 4th Class
- Cambrian College – Sudbury – 4th - 3rd - 2nd Class
- Lambton College – Sarnia – 4th Class
- St. Clair College – Windsor – 4th Class
- Georgian College – Owen Sound – 4th Class
- **Effective January 1, 2010 the following Power Engineering Course statistics applied:**

Students by Engineer Class	Total Number
4 th class attending during 2009	229
4 th class graduated during past six years	755
4 th class failed during past six years	340
4 th class who quit course during the past six years	47
3 rd class attending during 2009	40
3 rd class graduated during the past six years	195
3 rd class failed during the past six years	1
3 rd class who quit course during the past six years	1
2 nd class attending during 2009	19
2 nd class graduated during the past six years	15
2 nd class failed	1
2 nd class who quit course	3

How many pass ?



How many fail ?



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Engineer Examinations

- The following information provides an overview of the number of TSSA examination attempts which were taken by candidates for certification between 2007 and 2009:

	4 th		3 rd		2 nd		1 st	
	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail
2007	505	400	498	318	266	146	95	49
2008	693	592	507	379	323	161	108	67
2009	938	564	910	427	653	233	211	69
Total	2136	1556	1915	1124	1242	540	414	185
% Fail	42		37		30		31	

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How many examination candidates attain certification?

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Number of New Certificates Issued 2007 - 2009

	2007	2008	2009	Total Per Class
Operating Engineer 1st Class	0	24	7	31
Operating Engineer 2nd Class	6	70	44	120
Operating Engineer 3rd Class	9	202	91	302
Operating Engineer 4th Class	71	242	292	605
Refrigeration Operator - Class A	8	8	8	24
Refrigeration Operator – Class B	68	60	78	206
Compressor Operator	15	17	21	53
Total Per Year	177	623	541	1341

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Are there any NEW plants?

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New Plants Registered Since 2007

Plant Class Type	Total
COMPRESSOR PLANT	21
HIGH PRESSURE POWER PLANT	142
HIGH PRESSURE STEAM PLANT	102
HIGH PRESSURE WATERTUBE LOW WATER VOLUME POWER PLANT	103
HIGH PRESSURE WATERTUBE LOW WATER VOLUME STEAM PLANT	130
HIGH TEMPERATURE WATER PLANT	2
LOW PRESSURE POWER PLANT	35
LOW PRESSURE STEAM PLANT	131
LOW PRESSURE WATERTUBE LOW WATER VOLUME POWER PLANT	5
LOW PRESSURE WATERTUBE LOW WATER VOLUME STEAM PLANT	7
LOW TEMPERATURE POWER PLANT	4
LOW TEMPERATURE WATER PLANT	7
REFRIGERATION PLANT	251
STEAM POWERED TRACTION PLANT	8
STEAM PRIME MOVER PLANT	4
Total New Plants Registered – 2007, 2008, 2009	952

How many plants does Ontario have?

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Total Ontario Plants Registered

Plant Class Type	Total
HIGH PRESSURE POWER PLANT	303
LOW TEMPERATURE POWER PLANT	9
HIGH TEMPERATURE POWER PLANT	2
LOW PRESSURE POWER PLANT	83
LOW PRESSURE WATERTUBE LOW WATER VOLUME POWER PLANT	13
STEAM POWERED TRACTION PLANT	63
COMPRESSOR PLANT	61
REFRIGERATION PLANT	981
STEAM PRIME MOVER PLANT	4
LOW TEMPERATURE WATER PLANT	10
HIGH PRESSURE WATERTUBE LOW WATER VOLUME STEAM PLANT	298
LOW PRESSURE STEAM PLANT	434
HIGH TEMPERATURE WATER PLANT	5
HIGH PRESSURE WATERTUBE LOW WATER VOLUME POWER PLANT	224
HIGH PRESSURE STEAM PLANT	293
LOW PRESSURE WATERTUBE LOW WATER VOLUME STEAM PLANT	23
Total Plants Registered	2806

Conclusions

- As the examinations profile indicates, there is no indication of any new momentum which will offset the problems that are likely to arise from the current reduction trend of Operating (Power) Engineers entering and progressing in the profession.
- It is necessary to attract more young individuals to become interested in the profession in order to maintain the level of qualified Operating (Power) Engineers required to safely support the Power Engineering industry requirements.
- More Fourth and Third Class Engineers need to be trained to become Second and First class Engineers in order to ensure the ongoing management and operation of Ontario's larger power plants.

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How Can You Help ?

- Support the Profession.
- Introduce the Profession to family, friends and students.
- Develop or support school career days to profile the Profession.
- Remember that certification is not an employment certificate, it is a privileged authorization to perform a public safety service.
- Be proud of your Profession and what you do.

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Questions ??



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