

High-Paying Jobs for High-School Graduates

In this whitepaper our focus is to talk about the following:

- a. Identification of a specific set of jobs that do not require a college degree, but pay very well and are very desirable.
- b. Why many unemployed Gr-12 graduates don't know about these jobs.
- c. What can be done to make Gr-12 graduates industry-ready? What can be done to increase their odds of landing such jobs.
- d. Some historic background about the nature of these jobs; how it's changed over time; and why these jobs are very attractive at the current time.

Recently an article by Melinda Sherrill appeared on the Net. She wrote:

“The demand for blue collar jobs, meanwhile, is high. As reported by the Bureau of Labor Statistics, there are 3.9 million job opportunities that require vocational training, many of which, surprisingly, pay extremely well.”

Information from her article is summarized in Appendix A, along with a web link to the full article. Please review the information summarized in Appendix A, and note the job ranked #6: [Chemical Plant and System Operators](#).

Do you notice something unique about this job category? A closer look will reveal that this is the only job classification in the list that requires no qualification other than a GED or Grade 12 diploma. All other jobs require some formal, apprenticeship or certification. Also note that this job pays better than some other jobs that require somewhat formal pre-requisites and training.

Also glance through Appendix C, which basically says that there are some jobs that are high-paying yet require only Grade-12 education. Appendix-C also lists pay scales for such jobs – in some cases the annual pay scales range from \$40,000.00 to \$90,000.00

Before we go further let's clarify and agree to some terminology:

Chemical Manufacturing Industry (CMI): This term includes “smokestack” industries where high pressures and temperatures are a part of the process, such as Chemical Manufacturing Plants, Power Plants, Natural Gas Processing Plants, Oil Refineries, etc. The term CMI pertains to job classification #6 we mentioned earlier.

Process Plant Operator (PPO): This phrase represents people who are employed as operators in the CMI.

The target of this whitepaper is classification #6: Chemical Plant and System Operators or similar jobs.

We intend to use the terms CMI and PPO in rest of the article. Example: CMI PPOs will mean: Chemical Process Industry Process Plant Operators. Again, to emphasize, in this article we focus on the CMI and the PPOs.

To increase the readability we will also be using the term “he” while we mean “he/she”.

Let’s take care of one more piece of information: In the past, a few notions were prevalent. The first one being that the CMI process work was dangerous and not safe. This is not true anymore. Most safety concerns were valid in the 1980s and earlier periods, but since the late 1990s, the CMI process work is as safe as most other industrial work. The second notion that one routinely comes across is that females are not suitable for this kind of work. This is also not true anymore. There was a case to be made for this in the 1980s and earlier, when such work was performed in an unclean environment and physical strength was routinely required to perform the function. However, times have changed. In this day and age, the majority of the industrial work can be effectively performed by anyone, including 120-lb females.

THE CURRENT NATURE OF CMI

The CMI Operations jobs that we focus on are difficult for employers to fill. This situation has arisen over the last few decades and has become more pronounced; what’s more, there is no easy answer in sight for employers.

The Present Situation

- a. Today we have equipment and industrial processes which are designed to increase worker safety. However, the worker training in production processes is still questionable. Due to lack of resources, most CMI facilities do not have training departments. It is very expensive for them to train their workforce in the absence of properly staffed training departments. Another cost that employers have to consider is the months of non-productive paid time spent by a new employee while he is in training; employers would much rather hire someone who already has a sound knowledge of basic industrial technology.
- b. Most of the baby-boomers are going to be retiring in the next decade. For many industrial plants, about 40% of the workforce will retire by 2020. Many companies realize this and are scrambling to find solutions.
- c. Many employers try to work with the local community colleges to develop trained workforce. This initiative has not worked well for the process plant industry workers. To our knowledge, only about 5% of the US community colleges have adequate laboratory equipment and teachers who are really qualified to manage such training program. Unfortunately, the industry has discovered this and in many cases, the potential employers simply do not find what they are looking for amongst the community college Associates Degree graduates.
- d. At the time of writing (February 2016) opportunities provided by high-paying industrial jobs is still unknown to most people. You can do a simple test and ask ten unemployed high school graduates a

simple question “With your background and experience, where do you think you can get a high-paying job?” You will get all kinds of answers but very few will identify operational jobs in oil refineries, power plants and chemical plants, etc. Some will identify oil-gas drilling but will state that they have no earthly idea how to prepare to be considered for an entry-level job. (We do provide online training for entry-level oil-gas drilling jobs.) We really do not know exact reasons for this lack of general knowledge. Our best guess is that during many past decades, such jobs were quietly filled internally with no fan-fare – because these used to be low-tech jobs and practically anyone could enter the field and gradually master it. But now technology has changed, we deal with high pressures and temperatures, huge rotating equipment, etc. This means better quality (though with modest education) candidates are sought after.

How can such complex problems be addressed? This is where we (Houston Industrial Training Institute) come in. We provide the following services:

- a. We provide **industry-ready** training. For complex processes, we use simulations and animations which give the student a good feel for the process dynamics.
- b. In the article by Ms. Sherrill that we referred to earlier, it is stated that you only need a GED or Grade-12 education to apply for these high-paying jobs. While this is true, we believe that our certificates help candidates differentiate themselves from others and increase their chances of being accepted by the CMI facilities. For this reason, we provide a considerable amount of detail in our program descriptions.
- c. Our programs are totally web-based to allow prospective students to participate with us while keeping their current jobs.
- d. Our program cost is a fraction of what a student is likely to pay a community college or other vocational schools.
- e. We pride ourselves in providing a useful service to folks of modest means – please feel free to review our highly attractive program cost on our website.
- f. We try to make our programs as risk-free as possible. We realize that a small minority of potential employers will require an Associate’s Degree from a community college; while we only offer certificate programs. For this reason, we encourage our prospective students to print out our course descriptions and discuss them with potential employers **BEFORE** registering with us.

Now let’s look at some other aspects of industrial operator jobs.

Key Characteristics of CMI PPO Jobs Today

a. Nature of work: An operator’s job these days is quite easy job. A few decades ago, they were paid for their muscularity and ability to do strenuous work. These days they are paid for their knowledge. Let’s compare a PPO’s work with that of a hospital nurse. In a typical 8-hour shift (excluding lunch and other breaks) for about 90% of the time, a hospital nurse is probably on her feet, doing physical

work. For an operator, this number would only be about 20%. During this short period when a PPO does do hands-on work, he would perform chores such as opening/closing valves, writing permits, taking and labeling samples etc. The larger the facility, the closer the actual number is to 20% that is quoted here. In smaller facilities, this number could be a bit higher. The point is that it is an easy and rewarding job. Again, just to keep things in perspective, a typical nurse spends years going to college, works hard every day, and is paid much less, compared to an operator. In a sense a good approximation for an operator's job would be an airline pilot's job, where the pilot's job is not physically demanding, but a lot rides on his knowledge and alertness.

b. Immediate Future Prospects: All industrial facilities operate in a different manner; there is no "standard" mode of plant manning or operation. In general, every 6 to 12 months, the new employee is trained for more senior positions and eventually becomes a control room operator and then moves into a group-leader position. The senior-most OPP non-management position earns more than twice as much as the lowest position.

c. Long Term Future Prospects: An operator, after five or more years' of experience can bid on a supervisor's job and move into management positions. We will now explain how such promotions usually happen. First, an operator lets his management know that he is interested in moving up. More often than not, the company agrees and puts him on a training plan, which includes getting a bachelor's degree (evening classes) from the local college. The employer is usually happy to pay for this career advancement related education. When a management position opens up, the operator is asked to move up into management. A large number of people in senior management positions in the CMI started off as junior workers.

d. OPP Job Manning Requirements: The CMI PPO jobs have some unique characteristics. First, the operators hold the most critical profitability lever for the plant; a small operational mistake can easily turn into millions of dollars in loss. Second, for most 24-hour operations, each of the CMI PPO positions must be manned at all times, meaning, a day shift and a night shift. If the relief operator does not show up, the worker-in-place has to stay on the job until he can be relieved. While this causes hardship, the employer pays an enormous amount of overtime to the worker for his trouble. Third, experienced PPOs are valued by the management and there is always some kind of special activity going on, for example, plant turnarounds that generates extra income in the form of overtime pay.

e. Job Security: The process industry, like all other industries, goes through cycles of good times and rough times. During rough times, cost-reductions and layoffs occur. If you start noticing such layoffs, you will notice the CMI PPOs are almost never laid off. Engineers, accountants, supervisors etc. are in the layoff list – but the operators are seldom on this list.

SOME USEFUL HISTORY ABOUT CMI

At the beginning of this article, we outlined some erroneous notions about industrial work that some folks have in their minds. To understand how these have evolved over time, it would be helpful for us to review some history and see where we were versus now.

Let's start with the 1970s and work our way into the present time. We will limit our focus to process industry manufacturing jobs only.

The 1970s

During this period, the United States had a robust industrial base and the whole world wanted US-manufactured products. The middle class was thriving and able to meet their needs – a typical US family had two cars, a modest house with a white picket fence, two children and a dog. Job security was not a big issue on people's minds and most families had limited debt. All was well.

This social situation was a result of the following key drivers:

- a. Wages were low in comparison to the value of the product being made. But in an absolute sense, even during this period industrial worker wages were very attractive. For example, a newly hired industrial worker, with Grade 12 education, would make enough to buy a house and take care of his family.
- b. Profit margins were high.
- c. Industrial equipment was relatively uncomplicated. As a matter of fact most of the controls were of pneumatic design – this means you could physically see the compressed air tubes snake through the plant as control signals flowed through these tubes.
- d. Due to low wages, many facilities could afford to over-staff, and many did.
- e. Environmental regulations were almost non-existent (compared to what we have today).
- f. Employee injury rate was very high (compared to what we have today).
- g. International competition was weak. Whatever the US produced was sold world-over at a high profit margin. Made-in-USA was the international gold standard. There is a lot of anecdotal evidence which suggests that Europeans, such as the makers of Mercedes, tried to generate business in the foreign markets by advertising that their product was better. While this may have been true, the Made-in-USA gold standard trumped all others.
- h. For the most part, formal employee training did not exist. In most manufacturing facilities, training of new industrial workers was done through the "buddy system". The training process went something like this: a new hire was paired with a senior operator and followed his mentor around to learn the ropes. It took a long time for the new-hire to become proficient – but the labor cost was low and little attention was paid to training.
- i. The process operator's job was dirty and dangerous, which involved dealing with dirty chemicals and equipment, many times in ill-ventilated and ill-lit locations.
- j. For years on end, there were serious industrial incidents on a weekly basis such as explosions, uncontrolled chemical releases, large fires, etc.

At the end of 1970s, the manufacturing end of the process industry was under pressure due to increasingly powerful forces such as:

- a. The US OSHA gradually started to find its voice, which largely depended on the Washington DC political mood.
- b. The government was interested in two major areas: first, the employee-injury rate; & second, the built-in process-safety (which was basically the process design as far as safety was concerned). A federal initiative called Process Safety Management (PSM) started to take shape.
- c. Many labor movements demanding better pay and working conditions started to become aggressive.
- d. The potential safety concerns in process manufacturing industries began to increase due to higher pressures, higher temperatures, new chemicals, higher rotating speeds, lower tolerances for sub-normal conditions, etc.

These reactive, but corrective, forces started to change the industrial chemical manufacturing landscape.

The 1980s

- a. Wages of industrial workers began to rise.
- b. Profit margins became tighter as competition grew – especially from overseas.
- c. Industrial equipment complexity increased, which required better training.
- d. Staffing levels began to reduce, thus increasing the load on the remaining staff, requiring yet more training.
- e. Environmental regulations still remained largely non-existent – compared to what we have today.
- f. Employee injury rate, while high, became reportable. The plant senior management started to pay attention in response to the government's closer scrutiny. Incidentally, slogans such as "Safety is Job 1" which we commonly see today were not initiated by the long-term vision of industry leaders – it came about because the government made it too difficult for the industry to ignore safety.
- g. In many cases, Training Departments were created, especially at the large industrial facilities. While this was a good start which was welcomed by all, the real training continued on the "buddy system."

The 1990s

The 1990s showed the beginning and entrenchment of a perfect storm caused by seemingly unrelated events. Here are some of the key events that impacted the world of industrial workers:

a. In the late 1980s and 1990s, the industrial world was shook up by a number of industrial accidents. A sampling is provided in Appendix B.

b. The frequent industrial accidents gave US OSHA grounds to implement its OSHA PSM legislation, which created an enormous amount of worker-safety and readiness requirements for the employers. This item resulted in employers trying to seek contractors to train their employees on safety aspects. There was still another issue: while workers did learn to work safely, they did not know enough about their production processes.

c. The profit margins continued to shrink due to local and offshore competition.

d. The US EPA started to implement its legislations regarding safety, clean air and clean water. This resulted in investments required to support clean water and air, e.g. processing facilities of wastewater and electrostatic precipitators for the flue gas emissions. This resulted in lower availability of resources for optimization and efficiency improvement projects; budgets for operator training were curtailed sharply and many in-house training departments were closed.

e. Labor cost continued to rise due to powerful labor movements.

At Houston Industrial Training Institute we bridge the gap by providing highly affordable industry-ready training. United States is an industrial country and has tens of thousands of manufacturing facilities – all of which require a large number of workers. This offers great opportunities for folks who don't have an education beyond grade 12 but are looking for a high paying, long term job.

HoustonIndustrialTraining.com is one of the very few portals to help candidates become the front runners for these jobs.

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Appendix A

Article Title :10 of the Highest Paying Jobs That Don't Require a College Degree

Author: Melinda Sherrill

Link for full article: <http://nextshark.com/10-of-the-highest-paying-jobs-that-dont-require-a-college-degree/#rmns>

Listing of jobs – summarized from the article.

Rank	Job Title	Average Hourly Rate \$/Hr	Qualifications Required	Other Information
1	Construction Managers	45.47	Requires knowledge of construction and certification through the Construction Management Association of America (CMAA).	This is a job that requires people to work their way up the ranks, unless they have a college degree.
2	Power Distributors and Dispatchers	37.58	Training: Certification from vocational school and a license through the Nuclear Regulatory Commission (NRC) if operating with nuclear reactors.	
3	Elevator Installers	35.37	Some states require certification or work as an apprentice beforehand.	Other information: Economists predict demand to exceedingly increase by 2020.
4	Boilermakers	28.93	Requires starting out with an apprenticeship.	
5	Locomotive Engineers	27.41	Requires Federal Railroad Administration certification.	
6	Chemical Plant and System Operators	27.01	Just a GED or high school diploma is required.	
7	Underwater Welders	26.32	Requires welding and diving certification.	
8	Electricians	26.21	Becoming licensed is required, and apprenticeships are recommended.	
9	Millwrights	24.77	Most require welding certification and starting out as an apprentice.	
10	Technicians of Personalized Pool Routes	Not available. \$60-120 per pool.	Requires knowledge of pool chemicals and owning a business.	

Appendix B: A Summary of Major Industrial Accidents (1980s-1990s)

July 23, 1984: Romeoville, Illinois, Union Oil refinery explosion killed 19 people.

November 19, 1984: San Juanico Disaster. An explosion at a liquid petroleum gas tank farm killed hundreds and injured thousands in San Juanico, Mexico.

November 23, 1984 MESIT factory collapse. A part of a factory in Uherské Hradiště, Czechoslovakia collapsed, killing 18 workers and injuring 43.

December 3, 1984: The Bhopal disaster in India is one of the largest industrial disasters on record.

April 26, 1986: Chernobyl disaster. At the Chernobyl nuclear power plant in Prypiat, Ukraine a test on reactor number four went out of control, resulting in a nuclear meltdown.

May 5, 1988: Norco, Louisiana, Shell Oil refinery explosion. Hydrocarbon gas escaped from a corroded pipe in a catalytic cracker and was ignited.

May 4, 1988: PEPCON disaster, Henderson, Nevada. A massive fire and explosions at a chemical plant killed two people and injured over 300.

June 28, 1988: Auburn, Indiana. Improper mixing of chemicals killed four workers at a local metal-plating plant in the worst confined-space industrial accident in U.S. history.

July 6, 1988: Piper Alpha disaster. An explosion and resulting fire on a North Sea oil production platform killed 167 men.

March 24, 1989: Exxon Valdez oil spill. The Exxon Valdez, an oil tanker bound for Long Beach, California, hit Prince William Sound's Bligh Reef, dumping an estimated minimum 10.8 million US gallons.

October 23, 1989: Phillips Disaster. An explosion and fire killed 23 and injured 314 in Pasadena, Texas and registered 3.5 on the Richter scale.

July 5, 1990: Arco Disaster. An explosion and fire occurred at the Arco Chemical Company complex in Channelview, Texas.

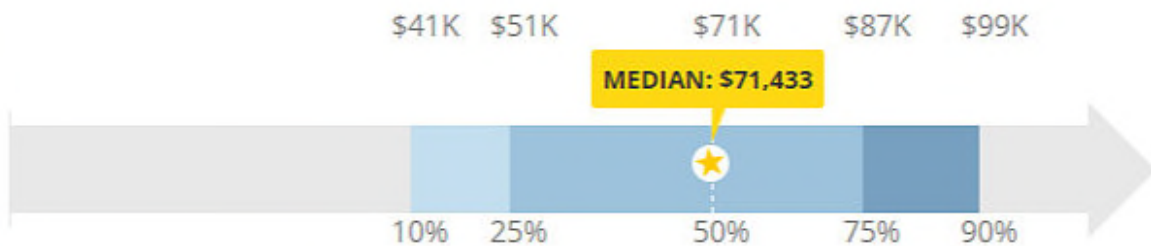
May 1, 1991: Sterlington, Louisiana. An explosion at the IMC-operated Angus Chemical nitro-paraffin plant in Sterlington, Louisiana killed eight workers and injured 120 other people. Texas. 17 people were killed.

Appendix C: Information from Multiple Credible Sources

The information provided in this appendix is self-explanatory – no editorial comments are provided. In each case the data source is identified as well.

Refinery Operator Salary (United States)

A sizeable majority of Refinery Operators in the United States are men. In this role, average pay is around \$27.01 per hour. Location is the biggest factor affecting pay for this group, [Read More](#)



Job Description for Refinery Operator

Refinery operators generally work in companies that are involved in the gas and oil industries, and the geographical locations of the jobs are limited to areas that have oil refineries. Generally, a high school diploma or equivalent is required, although additional education may be preferred. A professional background with refinery operations or a related field is usually needed as well.

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Refinery Operator Tasks

- Anticipate machinery malfunctions and develop contingency plans to minimize process interruptions.
- Conduct process control duties, identifying areas for improvement.
- Ensure smooth refinery operations through efficient use of equipment and regular maintenance.

Data Source: Courtesy: PayScale.com

RefineryOperator2

OCCUPATIONAL OUTLOOK HANDBOOK

Production >

Power Plant Operators, Distributors, and Dispatchers

Summary

What They Do

Work Environment

How to Become One

Pay

Job O

Summary

Quick Facts: Power Plant Operators, Distributors, and Dispatchers

2014 Median Pay ?	\$72,910 per year \$35.05 per hour
Typical Entry-Level Education ?	High school diploma or equivalent
Work Experience in a Related Occupation ?	None
On-the-job Training ?	Long-term on-the-job training
Number of Jobs, 2014 ?	60,000

www.bls.gov/ooh/production/power-plant-operators-distributors-and-dispatchers.htm

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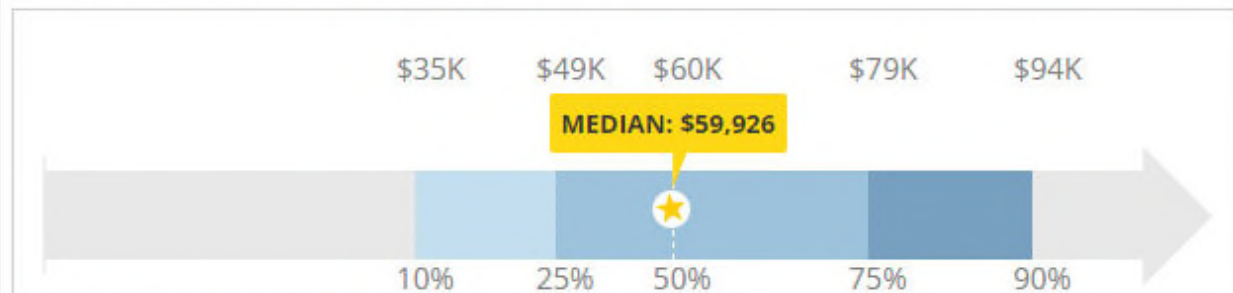
 UNITED STATES DEPARTMENT OF LABOR

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 **BUREAU OF LABOR STATISTICS**

Chemical Plant Operator Salary (United States)

Chemical Plant Operators in the United States are largely men, earning an average of \$21.29 per hour. In the world of Chemical Plant Operators, overall income ranges from \$31K near the bottom to \$80K at the top; this can include more than \$4K from bonuses and more than \$8K from profit sharing in exceptional cases. Nearly all enjoy medical while most get dental coverage. Vision coverage is also available to the larger part. Most Chemical Plant Operators report high levels of job satisfaction. This report is based on answers to PayScale's salary questionnaire.



Job Description for Chemical Plant Operator

The chemical plant operator is usually hired by chemical manufacturing companies. This operator generally works in a factory or manufacturing facility. Many companies do not require any education beyond a high school diploma, although training at a technical school as a chemical operator can be preferable. The experience required varies, as some companies may be willing to hire those without previous experience in the industry. Others may require as many as 4 years' worth of plant operator experience. Some knowledge of machinery and their maintenance and upkeep can be helpful, although not necessary for all positions in the field.

[Read More...](#)

Chemical Plant Operator Tasks

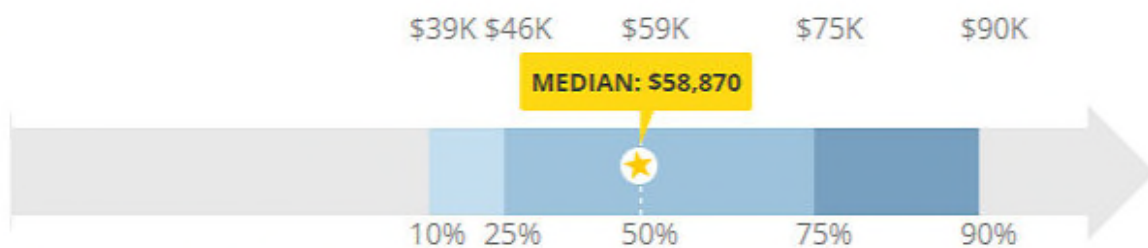
- Take samples and watch chemical reactions to test for product conformance.
- Adjust and calibrate equipment, working with technical personnel to achieve desired product specifications.
- Monitor and interpret instrument panels and indicators, ensuring equipment performs as expected.
- Unload, load, and package raw materials, waste products and products.

Data Source: Courtesy - PayScale.com

PayScale.com

Power Plant Operator Salary (United States)

Very much a male-dominated career in the United States, Power Plant Operators earn an average of \$26.84 per hour. Residence is the biggest factor affecting pay for this group, [Read More](#)



Job Description for Power Plant Operator

Power plant operators control and operate machinery that generates electric power. They are also responsible for maintaining these machines, which also includes auxiliary equipment, steam engines, air compressors, and generators. They also work with turbines (including steam turbines) that provide light and heat for other buildings.

[Read More...](#)

Power Plant Operator Tasks

- Make regular inspections of the turbine, generator, boilers, or other plant equipment.
- Coordinate the operation of plants, dams, and stream flow in order to meet contracted power requirements.
- Communicate with branch offices involved in the operation of the power plant to relate status, data, and observations.
- Oversee, coordinate, and maintain power plant operations.
- Maintain documentation of changes in the function of equipment, rainfall data, and general operating instructions.

Data Source: Courtesy PayScale.com

PowerPlantOperator2

20 High-Paying Blue-Collar Jobs



No. 4 Petroleum Pump System Operators, Refinery Operators, and Gaugers

Average Annual Salary: \$60,290

Data Source: <http://www.forbes.com/pictures/efkk45ieei/no-4-petroleum-pump-system-operators-refinery-operators-and-gaugers/>