Survey and Assessment of Working and Health Conditions of Workers in High Risk Industries that Use Chemicals

Report submitted by the
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INTRODUCTION

In the landscape of the Philippine workforce, the precarious state of occupational health and safety (OSH) stands as a critical concern that demands urgent attention. Despite the evidence of a pervasive and significant number of occupational injuries, illnesses, and accidents, OSH in the Philippines remains undervalued and, more importantly, inadequately addressed.

The gravity of the situation becomes glaringly apparent when analyzing available data. In the year 2019 alone, 40,892 occupational injuries, with a significant 42.7% emanating from the manufacturing sector were reported. Meanwhile, the Integrated Survey on Labor and Employment (ISLE) reported 54,551 cases of occupational diseases, further underlining the magnitude of the challenge faced by Filipino workers (Lu, Jinky, 2022).

While the Philippine government took a positive step forward by enacting the Occupational Safety and Health (OSH) Law, Republic Act 11058, in 2018, the persistently subpar performance of companies in complying with OSH standards remains a cause for serious concern. Four years after the implementation of this landmark legislation, the Department of Labor and Employment (DOLE) reported that slightly over half of the local businesses inspected failed to adhere to OSH standards, illustrating a glaring gap between legislation and practical implementation.

The most recent Labor Inspection Report, covering the period from January to August 2023 and encompassing 25,387 establishments with 2.4 million workers, paints a disconcerting picture. The initial compliance rate stands at a mere 58.48%, and even after corrections, the overall compliance rate barely improves to 72.60%. This exposes a systemic failure in ensuring the safety and well-being of the workforce, with common violations including the absence of first aiders, safety officers, fire safety inspection certificates, formulated OSH programs, and mandated OSH training and education.

Compounding the issue is the limited number and problematic coverage of labor inspections conducted by the Department of Labor and Employment (DOLE) authorized labor inspectors. According to information presented by the DOLE during budget deliberations in Congress last October 2022, there are only 1,200 OSH inspectors. Each inspector requires a day or more to assess business compliance, and the duration depends on the size of the company. (from https://news.abs-cbn.com/news/10/15/22/many-small-businesses-fail-to-observe-occupational-safety-standards-dole.) This scarcity of inspectors becomes evident in the face of the vast task at hand—ensuring OSH compliance in over one million establishments across the country. Consequently, the limited number of inspectors hinders the ability to conduct regular and thorough monitoring, exacerbating the challenges in upholding OSH standards nationwide.

Table 1. Total number of establishments that needs to get inspected

Size	Establishment	%Share
Micro	977,670	90.47%
Small	94,008	8.70%
Medium	4,444	0.41%
Large	4,516	0.42%
Total	1,080,638	100%

On the other hand, ordinary Filipino workers grapple with issues of low wages, irregular employment, and challenges in forming unions. For many, these concerns take precedence over occupational safety and health (OSH) matters in the workplace. This broader context contributes to the observed low awareness of OSH among workers in high-risk industries who participated in the survey.

In the Philippines, numerous high-risk industries heavily rely on chemical substances. Given the labor-intensive nature of many of these companies, the associated hazards faced by workers are considerable. This study sets out to evaluate the level of worker safety and occupational hazards within three identified high-risk chemical companies: Globesco (paint industry), MEC (electronics industry), and Nexperia (semiconductor industry). The specific objectives of the study include the identification of chemicals used in these industries and the establishment of initial data on working conditions, along with an assessment of the control measures implemented by the respective companies.

As we delve deeper into the findings of this research, it becomes imperative to acknowledge the urgent need for heightened awareness, accountability, and tangible actions to address the current state of occupational health and safety in the Philippines. The persistent neglect of these vital aspects of workers' health and safety necessitates a comprehensive and concerted effort to bridge the gap between legislation and the realities faced by workers in high-risk industries.

This study endeavors to provide a description of the diverse experiences of workers concerning the chemicals they encounter and handle in their workplaces, shedding light on how these substances impact their working and health conditions. Through this study, the aim is to contribute valuable insights that can inform policies and practices, fostering a safer and healthier environment for workers in high-risk industries.

METHODOLOGY

Study Sites

The three companies included in the study operate factories with distinct industrial processes, utilizing various materials that potentially pose hazards. MEC and Nexperia are electronics companies, while Globesco specializes in paint production.

MEC, an electronics firm under the ACES group, is a leading designer and manufacturer of cable assemblies and wire harnesses. Located in Rosario, Cavite, it comprises three buildings and employs 576 individuals, with a gender distribution of 63.37% female and 36.63% male.

Nexperia, a subsidiary of the partially state-owned Chinese company Wingtech Technology, operates in the electronics industry, specifically semiconductor manufacturing. Situated at the Light Industry Science Park of the Philippines in Cabuyao, Laguna, Nexperia has two buildings (administration and factory) and a total of 3,500 employees. The workforce composition is 40% male and 60% female. Regular employees follow a three-shift, 8-hour schedule for 6 days, while contractual workers adhere to a two-shift, 12-hour schedule for 4 days.

Globesco, a paint company established in 1959, operates from Sto. Domino Avenue, Quezon City. Specializing in water-based paints, solvent-based industrial paint, epoxy (adhesive), and other special products, Globesco has three buildings and employs over 200 individuals. The workforce distribution includes 90% male and 10% female employees, with more than 60 being regular workers, over 40 contractual or casual workers, 40 in administrative roles, and the remaining employees serving as agents.

All three companies have a workers' union.

Data Collection

Survey

For the data collection, IOHSAD conducted a survey. The questionnaire covered work-related and health-related questions, as well as questions on environmental health and work environment.

After pre-testing, the questionnaire was given to enumerators. The survey targeted 50 workers from each of the three companies (n=150) and was conducted from March 2023 to May 2023.

Focus Group Discussions

From survey results, the team chose highlighted cases to become participants for the focus group discussions (FGDs). Inclusion criteria were job longevity, age, type of job or the position (e.g., exposure to chemicals), and medical background, and among others. The FGD

covered themes about workers' experiences in their workplaces, including: hazard mapping, company profile, production process, medical aspect, and sharing of stories.

RESULTS

Survey Results

Of the target survey participants of 50 per company, MEC had 50 respondents while Nexperia and Globesco had 32 and 26 respectively. The total response rate was 72% (108/150). Table 2 below shows the demographics of the survey respondents.

Table 2. Socio-demographics of Respondents

	MEC	**Globesco**	**Nexperia**
No. of Respondents	50	26	32
Mean Age (years)	40 (n = 50)	38 (n = 25)	35 (n = 30)
Sex	F: 39; M:11	F:0; M:26	F:2; M: 30

Majority of the respondents were regular employees (98 or 90.74%). By length of service, the distribution was more spread. Most (28.70%) had been with their companies for 6-10 years although 25.93% had also been with their companies for less than 5 years. Some had been with their companies for 16-20 years (12.03%) and 21-25 years (9.26%).

Majority (89 or 82.41%) also worked for 8 hours per day although some respondents worked for 12 hours per day. Almost half (49.07%) receive wages amounting to only Php 401-500 per day (US$ 7 to US$ 9 a day).

In terms of possible exposure to hazardous chemicals, only 30 out of 108 (27.78%) were aware of previous exposure to hazardous chemicals. The remaining 68 (62.96%) denied or were unaware of such exposure.

Table 3 shows the other socio-demographics data.

Table 3. Sex, Age, Civil Status and Educational Attainment of respondents per company

	MEC	**Globesco**	**Nexperia**
Sex (F;M)	F:39 ; M:11	F:0 ; M:26	F:2 ; M:30
Age Range (years)			
21 - 30	12	2	10

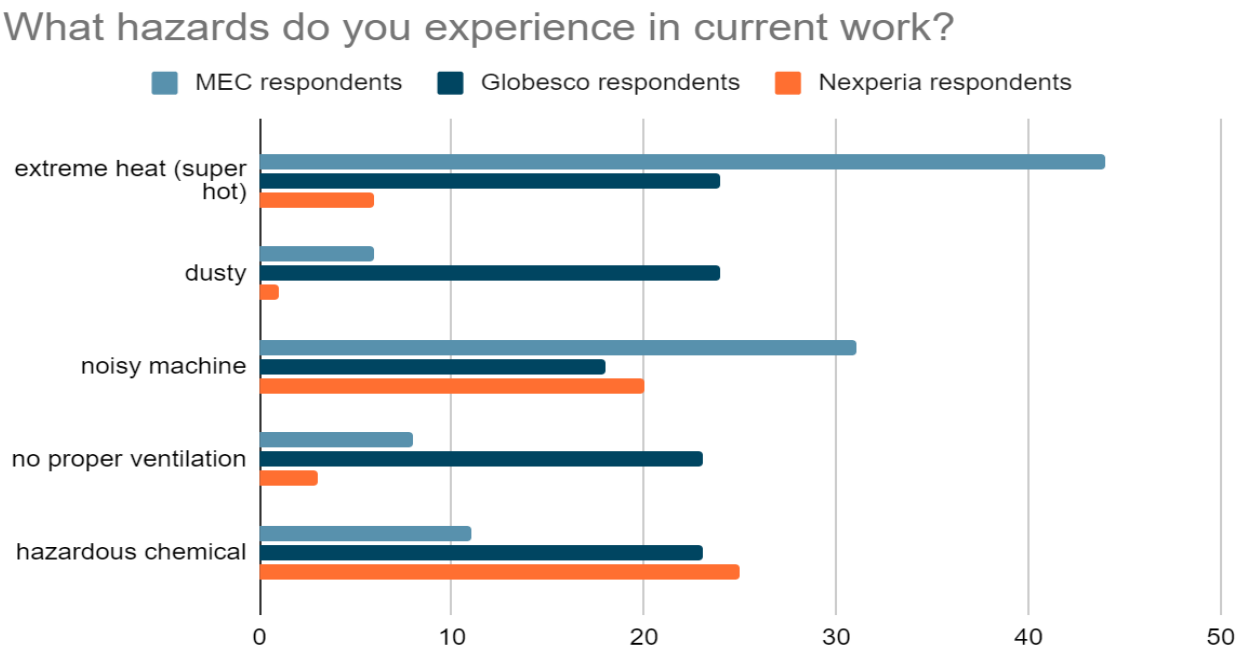
31 - 40	10	15	13
41 - 50	20	5	6
51 and up	7	2	1
Civil Status			
Married	29	19	19
Single	19	5	11
n.a.	2	2	1
Live - in	0	0	1
Educational Attainment			
Vocational	7	5	9
High school	34	17	0
College	9	2	21
Elementary	0	2	0
No answer	0	0	2

On the survey question “Did you get ill in your previous work?” *(“Nagkaroon ka ba ng karamdaman sa dating trabaho?”)*, 12 out of 108 participants responded affirmatively, while 81 said that they did not have illnesses. For the 12 who answered yes, their corresponding illnesses were flu-like symptoms (3), body and headaches (3), surgical conditions (operations in kidney, goiter, myoma, and appendix) (2), and other illnesses such as pneumonia, tuberculosis, dengue, and thyroid (2).

Safety and Health in Workplace

Hazardous chemicals and areas of exposure were identified per company. In MEC, noxious odors were produced by burning PBCs. This occurred in the recycling/disposal of rejected PBC. In Globesco, different chemicals are being encountered by its workers. In Nexperia, workers are exposed to solvents, acidic and caustic solutions, flammable materials, and lead.

The following tables contain the survey results:
Figure 1.



The top five answers or symptoms experienced by the respondents are: extreme heat (super hot) (MEC = 44; Globesco = 24; and Nexperia = 6); dusty (MEC = 6; Globesco = 24; and Nexperia = 1); noisy machine (MEC = 31; Globesco = 18; and Nexperia = 20); no proper ventilation (MEC = 8; Globesco = 23; and Nexperia = 3); and hazardous chemicals (MEC = 11; Globesco = 23; and Nexperia = 25).

On item 18, “Do you use chemicals in your work? (Gumagamit ka ba ng kemikal?),” 21 out of 50 (42%) from MEC responded yes; 24 out of 26 (92.30%) of Globesco said yes; and 27 out of 32 (84.38%) Nexperia workers answered yes.

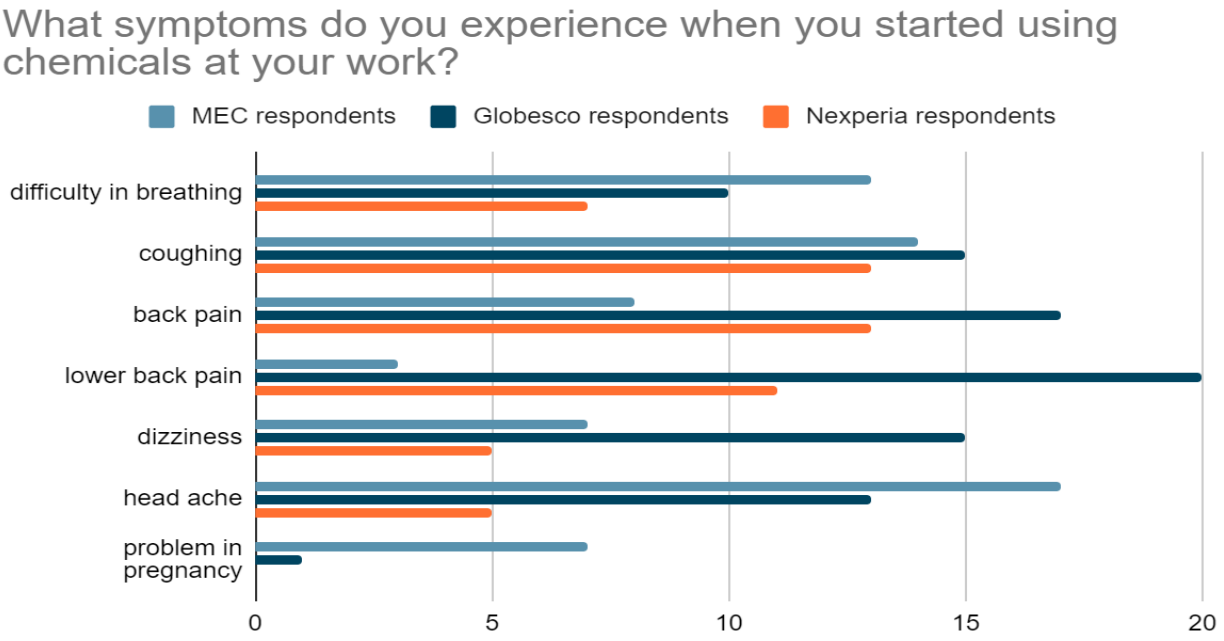
The chemicals that MEC workers encountered are the following: MBK, MIBK, Flux, Alcohol, Alteco, PUC/Z black 45.3, Tinning bar, Sold Lead, lubricant, tinning flux, Varnish, Soldering Glid, and Silicon.

Here are some of the chemicals that Globesco workers encountered: solvent, omyacarb, nitrocellulose, methanol, acetone, lacquer thinner, MER, Toluene, y-21, y-72, y-50, y-23, y-65, Mergal K14, Aluminum paste, Nipacide, and Dapro Bez.

For Nexperia workers, here are some of the chemicals they encountered: sulfuric acid, copper, soniac clean, fazestron, flux, nitric acid, flux, acetone, sodleron ST200, sodium hydroxide, acid, descaler, PF - Sn20, PF - A, PF - 200s, nickel sioto clean.

On the other hand, item 19 in the survey asks workers whether they are given an orientation about his or her work, *“Nabigyan ka ba ng oryentasyon?”* , 21 out of 50 (42%) answered yes for MEC; 6 out of 26 (23.0%) from Globesco; and 30 out of 32 (93.75%) Nexperia workers said that they are given orientation by the company.

Figure 2.



For the purpose of organization, six of the most frequent answers to this question (i.e. item 20. *What symptoms do you experience or feel when you start using chemicals at your work?)* were chosen. The top results were: **difficulty in breathing** (MEC = 13; Globesco = 10; and Nexperia = 7), **coughing** (MEC = 14; Globesco = 15; and Nexperia = 13), **back pain** (MEC = 8; Globesco = 17; and Nexperia = 13), **lower back pain** (MEC = 3; Globesco = 20; and Nexperia = 11), **dizziness** (MEC = 7; Globesco = 15; and Nexperia = 5) and **headache** (MEC = 17; Globesco = 13; and Nexperia = 5).

We incorporated an additional question (item 29.1) in the survey, inquiring about any pregnancy-related issues. The responses were as follows: MEC had 7 instances, Globesco had 1, and Nexperia reported none. Notably, despite all respondents from Globesco being male, one individual reported reproductive health problems, specifically difficulties with fertility and experiencing a miscarriage *("hindi magka-anak, hirap mabuntis, at nakunan").*

While item 21.1, asks the workers whether they lift heavy things? To emphasize, 25 out of 26 (96.15%) said they do. Globesco is a paint industry company that mixes different chemicals to produce paints.

Table 4. Item 22. Do you experience accident/s in your workplace?

	No. of respondents (MEC)	**No. of respondents (Globesco)**	**No. of respondents (Nexperia)**
Yes	14	18	5
No	32	7	26
No answer	4	1	1
Total	50	26	32

The above table shows the answers to item 22. Did you experience accident/s in your workplace? (*Nakaranas ka na bang maaksidente sa lugar paggawa?*) 14 out of 50 (28%) answered yes from MEC, 18 out of 26 (69.23%) Globesco workers responded yes, and only 5 out of 32 (15.625%) answered yes in Nexperia.

For MEC, this is followed by the question item number 22.1, what are these accidents: accidentally dipped in the skin, finger was caught between the machine, accidentally dipped in the eye, burnt skin, and amputated or clipped finger (*natilamsikan ng kemikal ang balat, naipit ang daliri sa makina, natilamsikan ng kemikal sa mata, napaso ang balat at naputol ang daliri sa kamay*).

For Globesco workers, accidents are the following: accidentally dipped in the eye and skin, poured with chemical, slipped, fell down with heavy load/materials, burned skin, and finger caught in machine (*natilamsikan ng kemikal ang mata, natilamsikan ng kemikal sa balat, nabuhusan ng kemikal, nadulas, nabagsakan ng mabigat na materyales, nasunog ang balat, at naipit ang daliri sa makina*).

For Nexperia workers, accidents included: accidentally dipped in the skin, poured with chemical, finger caught in machine, slipped, burnt skin, electrocution, fell down with heavy load/materials (*natilamsikan ng kemikal ang balat, nalagyan/tilamsikan ng kemikal ang balat, nabuhusan ng kemikal, naipit ang daliri sa makina, nadulas, napaso ang balat, nakuryente, at nabagsakan ng mabigat na materyales*).

Table 5. Presence of PPE, APE, Health facility, OSH Personnel

	No. of respondents (MEC)	**No. of respondents (Globesco)**	**No. of respondents (Nexperia)**
Is there PPE?			
Yes	44	18	30
No	3	8	1
Lack something	0	0	1
Is there an Annual Physical Examination?			
Yes	49	21	32
No	0	3	0
No answer	1	2	0
Is there a health facility and supply in your workplace?			
Yes, there is	47	24	32
No	0	1	0
No answer	3	1	0
Is there an Occupational Safety and Health (OSH) Personnel in your company?			
Yes, there is	45	23	32
No	0	2	0
No answer	5	1	0

In MEC, 44 out of 50 (88%) of workers use PPE. In Globesco and in Nexperia, 18 out of 26 (69.23%) and 30 out of 32 (93.75%), respectively, use PPE in their workplace.

In terms of an annual physical examination (APE), 49 out of 50 (98%) workers in MEC responded as having one. For Globesco and Nexperia, 21 out of 26 (80.77%) and 32 (100%), respectively, had an APE.

In MEC, 47 out of 50 (94%) were aware that their company had health facilities (and supplies) at the workplace. In Globesco, 24 out of 26 (92.30%) were aware and in Nexperia, all of the respondents (100%) were aware.

Similarly, in terms of awareness of an OSH Personnel in the company, 45 out of 50 (90%) respondents in MEC were aware. In Globesco and in Nexperia. 23 out 26 (88.46%) and 32 (100%), respectively, were aware.

For item 34. Is there any labor inspection done by DOLE?, in MEC, 17 out of 50 (34%) answered yes, there is a labor inspection done by DOLE in their company. 10 out of 26 (38.46%) responded yes from Globesco workers. And 15 out of 32 (46.88%) answered yes also in Nexperia. All in all, 48 out of 108 (44%) showed that there was a labor inspection done in their company.

Focus Group Discussions

Three FGDs were conducted between June 12 and July 8, 2023. A total of 14 workers from the three companies participated in FGDs (Table 6). Their demographic and work-related date are shown in Table 6. An OSH consultation with workers in the paint manufacturing sector was conducted on August 13, 2023 as an augment activity aside from the FGD with Globesco.

Table 6. FGD

Company	**Date of FGD**	**Place of FGD**	**No. of Participants**
MEC	12 June 2023	Tanza, Cavite	8
Globesco	14 June 2023	España, Sampaloc, Manila	2
Nexperia	08 July 2023	Nexperia Union Building, Cabuyao, Laguna	5
Globesco	13 August 2023	Kamias, Quezon City	17

The following table presents the medical conditions of the participants or the participants' shared stories either their own or colleagues' experience or experience.

Table 7. On Types of work in the company, Medical Illnesses, Current health complaints

	MEC	**Globesco**	**Nexperia**
Age range (years)	20 - 50	36 - 40	20 - 45

Sex	F: 8; M:0	F:0 ; M:2	F: 0; M: 4
Year with the company	1 - 33	13	-
Types of Work in the Company	Soldering: 7 Tinning: 2 Crimping: 2 Visual: 4 Burning rejected PBCs:2	Paint filler: 2 Machine Operator: 1	Sawing Inspection Frontline Clipbonding Molding Dry Flushing Plating Packaging
Medical Illnesses	Ovarian cyst: 1 Myoma: 1 TB: 1 Pneumonia: 1 Traumatic amputation: 1 Cyst: 2 Hysterectomy: 2 Breast Surgery: 1 Ovarian surgery: 1 Miscarriage: 1 Allergy: 1 Osteoarthritis (fingers): 1 Electrocution: 1	Mental Illness (due to Toluene): 1 Respiratory Illness: 1	-
Current health complaints	DOB, respiratory: 3 Muscle pain from standing: 2 Muscle pain on arms and legs: 1 Nervousness: 1	respiratory ilnesses	Hypertension Musculoskeletal Disorders Bone tuberculosis

Table 8. Hazard Mapping and Working Health Conditions in the Workplace

Company	**Working Health and Hazard Conditions**
MEC	● In Stripping and Crimping processes, there is a possibility that fingers or even hands can be caught in between. ● In Molding process, heat and strong odor which smell like burnt

<table>
<tr><td></td><td>plastic are experienced by the workers.
● Hazards experienced by the workers can appear in extreme heat, smells fo a rubber in the whole workplace and the possibility of being in an accident.
● In Soldering process, there is the absence of a large electric fan that can act as an exhaust fan in the whole assembly line. Or simply put, the workplace is not in an air-condioned place.
● Today, the company is saying that they are a “lead-free” chemical company. But the observations of the respondents state that before, the chemicals the workers use did not have odor. Now, it has a strong smell. At the same time, there was a black smoke produced.</td></tr>
<tr><td>Globesco</td><td>● There are three (3) departments: Sphero, Glotex, and Manor. Comparing the three buildings, Glotex is the smallest building. This is followed by Sphero, then Manor as the largest building. The following table describes the perspective and experience of the respondents. These data are described by the participants:

<table>
<tr><th>Bldg</th><th>Bldg Size</th><th>No. of machines</th><th>Products</th><th>Operator</th><th>Expected Output</th></tr>
<tr><td>Sphero</td><td>medium sized</td><td>17</td><td>quick dry enamel, Enamels</td><td>2 groups assigned (4 persons per group - 2 regular and 6 casual workers)</td><td>10,000 to 15,000 liters</td></tr>
<tr><td>Glotex</td><td>small sized</td><td>10 or more</td><td>-</td><td>2 regular workers and 6 casual workers</td><td>-</td></tr>
<tr><td>Manor</td><td>large size building</td><td>20</td><td>epoxy, primer white, resin making</td><td>-</td><td>21,000 liters per day</td></tr>
</table>
</td></tr>
</table>

	• According to Respondent A, the powder went into his face. The powder was Nica 800 with paints like strong solvents called Y-23, Y-21, Y-65 and Y-60. Respondent A accidentally got his skin peeled off upon being burnt. Evidently, workers are vulnerable to accidents. • On the issue of ergonomics, it is estimated that 6,000 kilograms (6 tons) of powder are lifted by two (2) workers in a day. To add, upon lifting of powder to the machines, workers remove the masks because it makes them hard to breathe. There were also plastic googles given by the management, but the workers' concern is that it should be glass. • In respondents A's description, in the place near and in the machines, the temperature is so hot. The ventilation is inadequate. There is also noise pollution due to the machines. There are also fumes being seen and breathened. The machines are also hot due to the "cooking" of paints. And in cooking, smoke appears which is inhaled by the workers. For workers in sitting position, fumes are still inhaled. For example, nitro cellulose is a wet cotton-like substance which is flammable. It should be stored in a cold place. It is used for adhesiveness and shine purposes. It can be held by bare hands and has a stronger smell than alcohol. • In another case, a worker got nose bleeding for three (3) hours. The vein or artery blow up due to hot temperature and high pressure. He got operated due to high temperature in the workplace as brought by low ventilation. The general manager of the company did not acknowledge the accident or case as work-related. • It is also pointed out that there is no fire exit. At the back of the factory building, there is no exit there. Backyard has been in barbed wire with ground.
Nexperia	• **Exposure to Chemicals**. In soldering process in the Frontline exposes the workers to direct contact with lead. The solder-paste similarly raised concern given the uncertainty of the workers of its

	contents, that it might essentially still contain lead. The materials used in Molding, including the rubber sheet and wax or machine conditioner, similarly have dangerous components. In addition, the mold needs to be heated at 175 degrees celsius, which exposes the workers to risks of getting burnt, along with vision discomfort and other eye hazards. However, the respondents deemed Plating as the most dangerous step in the production process, as it exposes them to multiple dangerous chemicals. ● PPE. The respirators that protect the workers from inhaling dangerous substances are not being replaced despite having been expired for a long period of time. Meanwhile, smock suits are given only once a year, leaving workers no choice but to repeatedly wear their suits without washing it for an entire week. The workers also have to take home their smock suits since they are responsible for washing them, similarly risking their families to exposure from the chemicals that are on the suits. ● Orientation on Hazards and Chemical Use**.** The respondents revealed that orientation on chemicals and hazards only include instructions in case the chemicals are ingested. Other information concerning the chemicals, including substance inhalation and other methods of contact were not explained to the workers.

Table 9. Medical Aspect

Company	Medical/Health Conditions
MEC	● Management Perspective: For the annual medical examination of the workers, **tuberculosis and pneumonia** are the most common diseases being diagnosed. According to the management's protocol, the patient will be called by the Human Resources (HR) department, who will tell the worker that his or her case should be confidential. The respondents point is that other workers are not informed (i.e. tuberculosis is a communicable disease). The respondents also noticed that the ones being diagnosed are mostly regular workers that would mean workers who have been in the company for a long time.

	● In accidents, there were cases of burns due to testing of power cord with the electricity. The hazard lies in that the worker might get electrocuted. There are also cases that legs get electrocuted once touched with the electricity (high voltage - 220v). At the same time, in using a heat gun/machine or even a manual heat gun, once tried in the electricity, it can cause a short circuit.
Globesco	● A doctor is only present twice a month. He will page if he is present in the company. Then workers will go to his company clinic for consultation. ● The company has a retire and rehire concept/policy. They have the Php 1,200 x 38.5 x 23 (years) = 1.5 Million computation. If a worker reaches his or her twenty three (23) years in service, he or she is eligible to retire. It is mandatory for him or her to retire. It is upon his or her discretion whether to apply again in the company and get rehired.
Nexperia	● Annual Physical Examination. Employees continue to work regardless of the ails that they endure. They are also required to get their annual physical exam from the company's medical partner. However, only those who are found to have medical abnormalities are called in to address their results. For the rest of the workforce, they are not allowed to have a copy of their annual medical results. ● Health-oriented policies. A health-oriented policy that is observed is the food-restriction ruling that they have in their cafeteria. It was shared that during Mondays, no soft drinks are sold. On Wednesdays, no junk foods are available. Finally, on Fridays, no meat viands are sold in the cafeteria to promote workers' vegetable consumption. ● Health Risks to be Addressed. Chemical risks need to be addressed right away. Apart from this, hypertension, musculoskeletal disorders, and bone tuberculosis are common diseases observed in the workplace. Further studies should be conducted to determine the relationship between these diseases and the chemicals or job types that may contribute to these health risks.

In Globesco, the chemicals used by the workers are listed in Table 10 below. These answers are given during the focus group discussion.

Table 10. Chemicals present in Globesco

Chemical (called in the factory)	**Description of the Respondent/Worker**
Y-23	for viscosity purposes
Y-21	for viscosity purposes
Y-65	dissolver
Y-60	
Y-50	100% acetone
Y-72	for the solution to be watery
Y-51	for the solution to be watery; sometimes it is called MIK; it tastes bitter
Carbon black	when it is hot temperature, the container blows up
Nitro Cellulose	must be stored in a cold storage, the storage should be separate from the production area. But the company does not comply.
Y-17	gas, tinner, kerosine
Omyacarb	powder
Daprobez	liquid, additive, paint
Mergal	powder
SM 150	in Glotex, water-based

Aluminum paste	has a strong smell and respiratory
MEK	in Glotex
Y-44	automotive, wood
Y-21 (toluene)	clear liquid; once inhaled, can get drunk, flashbacking, suffocation; universal in use
Y- 50	
Y- 65	
Y-39	solvent
Y-23	
Y - 40	smells like plastic balloon

Of note, although the majority of the chemicals used labels that did not specify their content, at least four were identified: carbon black, nitrocellulose, mergal, and toluene.

ANALYSIS AND DISCUSSION

This study revealed significant gaps in workplace safety at different levels. Most pronounced of this is the violation of the workers right to know, which cuts across the three different companies regardless of work station.

In the case of MEC, women workers faced challenges in identifying the chemicals to which they were exposed and were unable to name specific hazardous substances. However, survey responses indicated mentions of various chemicals such as MBK, MIBK, flux, alcohol, Alteco, PUC/Z black 45.3, tinning bar, sold lead, lubricant, tinning flux, varnish, soldering glid, and silicon. Despite this, testimonies revealed potential health hazards, particularly from inhaling burnt PBC ("The smell is not good."), indicating that the workers experienced adverse effects without being aware of the specific chemicals causing these symptoms.

In the context of Globesco, the survey and subsequent validation in the Focus Group Discussion (FGD) identified several types of chemicals, each posing distinct risks. Carbon black and nitrocellulose were pinpointed as substances affecting the respiratory system, with Mergal being noted for its potentially fatal inhalation effects. Toluene, on the other hand, emerged as a skin and eye irritant. Interestingly, toluene is listed as one of the chemicals of concern used in the manufacturing of common electronic products and components, as indicated in the guidance for public buyers by Electronics Watch (November 2020).

Of particular concern is the revelation that the remaining chemicals used are merely labeled without any indication of precautions or ingredient details, characterized as arbitrary labeling. This lack of information circumvents the workers' right to know, as they are only acquainted with chemicals labeled arbitrarily, unaware of the potential hazards associated with them. Moreover, the issue extends to the inadequate orientation on these chemicals provided to workers before commencing their tasks, presenting a clear problem. The effectiveness of the given orientation in raising safety and health concerns among workers must be thoroughly investigated to address this critical aspect of workplace safety.

Consequently, the violation of the workers right to know has led to very poor awareness and low expectations regarding occupational safety among the workers. In the survey, only 27.78% of the respondents were aware of possible exposure to hazardous chemicals and answered affirmatively, even though all of the respondents were using chemicals in their work on a daily basis.

Apart from companies neglecting to ensure the workers' right to know, the alarming frequency of workplace accidents in these high-risk industries demands immediate attention. The data from MEC and Globesco underscore the gravity of the situation, revealing elevated percentages of workers experiencing accidents in their workplaces. Specifically, 28% (14 out of 50) in MEC and a remarkable 69.23% (18 out of 26) in Globesco reported such incidents. These elevated figures necessitate prompt action on the part of the companies to address and mitigate the risks contributing to these high accident rates.

This study also delved on the working conditions of workers. The hazard mapping demonstrated possible exposure and vulnerabilities in many essential processes within each company. These constitute talking points between the workers and company representatives that can lead to improved safety and efficiency. The unions should also consider including these in collective negotiations.

Within the scope of the study, the safeguarding measures adopted by the companies are often limited to providing masks (to counter noxious fumes) and furnishing personal

protective equipment (PPEs). It is noteworthy that the utilization of PPEs represents the lowest and least effective level in the hierarchy of controls *(referenced from https://www.safety-international.com/posts/hierarchy-of-controls/ retrieved last November 8, 2023)*. In MEC, 88% (44 out of 50) reported using cotton masks, while in Globesco, 69.23% (18 out of 26) rely on PPE. Notably, 8 out of 26 individuals in Globesco refrain from using masks due to breathing difficulties.

Beyond the inadequacy of appropriate PPE, the absence of strict occupational safety and health (OSH) control measures extends the potential danger to workers' families. As shared by Nexperia workers during the Focus Group Discussion (FGD), they bring their work shirts home for laundry. This practice raises concerns as it exposes their families and the nearby community to potential residues that may linger on their work attire. This scenario underscores the need for enhanced OSH measures to mitigate risks not only within the workplace but also in the broader community context.

Worker reports highlighting the absence of adequate ventilation in their workplaces raise significant OSH concerns. Specifically, MEC workers involved in soldering take the initiative to bring their own portable fans to address the deficiency of exhaust fans and proper ventilation in their work areas. In Globesco, the intense heat experienced by workers further compounds the challenge, leading to a reluctance to wear the necessary personal protective equipment (PPEs). It is crucial to note that government data indicates the indoor air quality program ranks among the least implemented OSH programs by companies. This underscores the urgent need for companies to prioritize and address ventilation issues as a crucial component of their OSH control measures.

Ergonomic issues are a significant concern in high-risk industries using chemicals, particularly at Globesco. A remarkable 96.16% (25 out of 26 respondents) report regularly carrying heavy chemical loads, resulting in common complaints of body aches, including back and lower back pains. Notably, government data reveals that work-related musculoskeletal disorders have consistently ranked highest among occupational diseases since 2015. This highlights the ongoing and critical nature of ergonomic challenges within the workforce.

Annual medical examinations (AME) play a vital role in early health issue detection, ensuring the well-being of employees, and fostering a proactive approach to workplace health and safety. However, the study brings to light a concerning revelation: AME results or records are not accessible to MEC workers. Despite the identification of common illnesses, such as pneumonia, among MEC workers, the lack of access to AME results hampers the potential to raise workers' health awareness. It is advisable for the union to address this issue with the management.

Similarly, in Nexperia, where heart problems and hypertension are prevalent among workers, the existing AMEs are not complemented by comprehensive occupational

safety and health (OSH) programs and services.

The presence of health facilities in all three companies may be acknowledged, as reported by the majority of respondents. However, the survey results, revealing workers experiencing various illnesses, underscore that the mere presence of health facilities does not translate to the provision of relevant health services. These facilities seem to serve a nominal purpose, appearing to comply with laws but lacking a real impact or purpose in safeguarding and enhancing workers' health and safety. This emphasizes the need for an assessment of OSH services and facilities in these workplaces, ensuring they deliver timely, relevant, and regular OSH programs and medical services for the workers.

The presence of government-issued OSH guidelines has proven insufficient in ensuring the health and safety of workers. Annual spot audits conducted by authorized labor inspectors have been mandated by the OSH Law. However, only a total of 48 out of 108 respondents (44%) are aware of labor inspections conducted by the Labor Department in their respective companies. Moreover, while workers are encouraged to be present during inspections to enhance transparency and accountability among stakeholders, this involvement has often been symbolic and performative. To strengthen the integrity of labor inspections and better reflect the OSH needs of workers, there is a pressing need to amplify workers' voices through their unions. This ensures that inspections remain honest, accurate, and proactive in addressing the concerns of the workforce.

The DOLE Department Order No. 136-14 Series 2014, titled "Guidelines for the Implementation of Globally Harmonized System (GHS) in Chemical Safety Program in the Workplace," addresses various aspects of chemical safety, with a focus on Section 6 (Chemical Safety Program Elements). This Order specifies two control levels: engineering and administrative, while also addressing the workers' right to know. Despite these provisions, the survey results reveal inadequate implementation of this order.

The government's commitment to ensuring the health and safety of workers handling chemicals is in question due to its failure to ratify the International Labour Organization (ILO) Chemicals Convention (No. 170) and Recommendations (No. 177), formulated since 1990. Encompassing various chemical safety aspects, from workplace chemical use to the classification and labeling of chemicals and employer responsibilities, the Chemicals Convention addresses crucial issues. With the classification of a safe and healthy working environment as a fundamental right and principle at work by the International Labour Conference in 2022, there is a pressing need to prioritize and push for the ratification of these significant conventions.

Workers in high-risk industries handling chemicals face evident exposure to hazardous working conditions. Beyond the imperative to safeguard their health and safety, they merit additional compensation and benefits for undertaking hazardous tasks. Notably, hazard pay is not mandatory for all workers in the Philippines.

While specific laws and guidelines currently grant hazard allowances to certain workers exposed to risks, such provisions are limited. The Magna Carta for Scientists, Engineers, Researchers, and Other Science and Technology Personnel in Government (Republic Act 8439), effective since 1998, establishes a hazard allowance for those engaged in hazardous undertakings or workplaces. This allowance ranges from ten (10%) to thirty (30%) percent of their monthly basic salary, contingent on the nature and extent of the hazard.

Moreover, registered chemists and chemical technicians handling chemicals as part of their regular duties are entitled to hazard pay and insurance coverage under Republic Act 10657, known as the Chemistry Profession Act of 2015, and its Implementing Rules and Regulations.

A critical discourse among workers surfaces a compelling question: why is hazard pay exclusively designated for professionals when all workers face similar risks with hazardous chemicals? Initial discussions within the three companies in this study underscore the need for hazard pay for all workers engaged in hazardous conditions, and a strategic plan is underway, expected to be implemented in the coming months.

Finally, while companies often dispute any direct correlation between diseases and the chemicals used, there is an undeniable prevalence of diseases affecting women's reproductive health. Conditions such as ovarian cancer, cysts, myomas, and hysterectomy are alarmingly frequent. The significance of this pattern necessitates thorough investigation to ascertain potential connections between workplace exposures and these health conditions affecting women.

RECOMMENDATIONS

These recommendations stem from discussions and consultations with workers in the three companies studied. We've organized urgent suggestions and recommendations for each company to facilitate monitoring and troubleshooting. Additionally, we emphasize in the general recommendations those that are related to OSH legislation and the ratification of international conventions. This underscores their importance in ensuring the government's responsibility for the health and safety of workers.

Recommendations per Company

1. **MEC**

- Demand for better protection and health care
  - Provision of free and proper PPE to workers
  - Upgrading and regular maintenance of exhaust system
  - Demand for the accessibility of the annual physical examination results be accessible to the workers

- Demand for the provision of hazard pay (plant-level negotiations with management)

- Provision of financial assistance to workers who have suffered from work-related injuries due to accidents should be negotiated with the management

- Awareness raising on specific hazardous chemicals identified
  - Further research on the correlation between soldering or inhalation of fumes and soldering; diseases or cysts in the female reproductive system and chemicals used in the production process

2. **GLOBESCO**

- Demand for better protection and health care
  - Ensure fire safety and exits in the workplace. Demand safety inspection from Labor Department or local government unit (LGU) with regard to company's fire safety standards compliance
  - Address ventilation issues in the workplace and chemicals storage especially for nitrocellulose
  - Provision of free and proper PPE to workers and improvement of general protective measures

- Conduct a complete situational analysis in the workplace.

  - Provide a comprehensive list of chemicals
  - Gather narratives and incident reports from workers regarding accidents, work-related illnesses, work-related illnesses and injuries.

3. **NEXPERIA**

- Demand for better protection and healthcare
  - Evaluation of the PPE's provided by the company – respirators, smock

suits, hygiene kits, etc.

- Conduct a complete situational analysis in the workplace.

- Apart from the chemical risks, hypertension, musculoskeletal disorders, and bone tuberculosis are common diseases observed in the workplace. Further studies should be conducted to determine the relationship between these diseases and the chemicals or job types that may contribute to these health risks.

- Conduct more interviews with workers (currently employed and retired) who have been affected with illnesses.

General Recommendations:

1. Collaborate with the three unions to conduct Hazards Identification, Risk Assessment, and Control (HIRAC). This active engagement will manage hazards and contribute to a safer workplace. It serves as a direct follow-up to survey results, facilitating prompt action on health and safety recommendations.

2. Support unions in establishing, managing, and consolidating their Workers' OSH Committees. Initiate regular medical consultations for workers with IOHSAD volunteer doctors to monitor symptoms and illnesses. Develop a systematic approach to safely document and make medical results accessible to workers.

3. Form a working group among survey respondents, FGD, and OSH consultation participants to create an OSH rights victims network.

4. Draft a bill proposing hazard pay for all workers in hazardous environments.

5. Initiate a campaign advocating for hazard pay for all workers in hazardous environments.

6. Expand outreach to workers and unions in the chemical sector. Enhance the Chemicals Sector Workers Network and formally launch it in April 2024.

7. Collaborate closely with existing alliances and networks such as the Metal Workers Alliance of the Philippines and WISE (Workers In Semiconductors and Electronics) Network in the campaign for safe workplaces and hazard pay for all workers.

8. Review Philippine laws on OSH and chemical safety. Propose amendments based on findings from review sessions and research.

9. Advocate for the ratification of OSH-related conventions by the Philippine government, especially ILO Convention 170 (Chemicals Convention).

10. Enhance workers' OSH awareness through regular training and educational discussions on OSH topics. Consolidate survey results and findings to produce a local OSH situationer for each union, enabling them to conduct OSH orientation among their members.

The Joint International Labor Organization/World Health Organization Committee's definition of occupational health states that:

"Occupational health should aim at: the promotion and maintenance of the highest level of physical, mental, and social well-being of workers in all occupations; the prevention amongst workers of departures from health cause by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the worker in an occupational environment adapted to his physiological and psychological capabilities…"

Filipino workers still have a long way to go in terms of occupational health. Philippine companies, including chemical companies, as well as government agencies, constitute major stumbling blocks. The struggle is real but our efforts continue.

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