Fire Safety Assessment Report

Manila Chemical Company

2 No. Jungle Latifpur, Jafrabad, Akbar Shah, Shitakundo, Chittagong.
Date of Assessment: 27th & 28th February, 2021

Date of Report: 1st March, 2021
Report Code: FSA-70
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AIPRO Thought Process

Aipro Engineering & Consultancy Service

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Executive Summary

A survey of the existing fire safety condition was undertaken at the **Manila Chemical Company**, on **27th & 28th February, 2021** by AIPRO Engineering & Consultancy Service. The survey was conducted as per Bangladesh National Building Code 2020 and other relevant Standards.

There are 5 structures in the factory premises namely: Production Shed, Office Building, Godown Shed-1, Godown Shed-2, Godown Shed-3. Total usable area of the factory was 4,956 square feet.

During the assessment, the fire safety system of the building was assessed for 67 checkpoints to form an opinion regarding the level of compliance with respect to Bangladesh National Building Code 2020 and other relevant Standards. Major issues of fire safety assessment are mentioned below:

- The factory shall maintain a minimum width of evacuation pathways (i.e. evacuation passageway 1.12m in storage area and 0.915m in other areas) as per code.
- The factory will remove all temporary stored items from evacuation pathways & ensure all evacuation pathways shall be free from temporary stored item.
- The factory shall remove all locking devices from evacuation exits.
- Emergency lighting was not provided for evacuation pathway.
- Chemical stores shall be fire separated by rated wall and rated door as per code.
- The factory shall prepare design drawings for the fire detection and alarm system in accordance with the code and install the fire detection and alarm systems as per code.
- Fire drill shall be conducted as detailed under the fire safety plan. The frequency of fire drill shall be as per BNBC Table 4.A.1.

Distribution of Checkpoints

The checkpoints were categorized as below, based on the timeline of implementation and the risk they possess. The following table and pie-chart show the distribution of checkpoints for the factory.

TABLE 1: DISTRIBUTION OF CHECKPOINTS

Sl. No	Priority Level	Implementation Timeline	No. of non-compliances	% share
1	Immediate	The facility should not continue to occupied until these non-compliances have been rectified	0	0%
2	1-2 Weeks	Action must be incorporated into a fire safety management plan in 1-2 Weeks	11	16%
3	6 Weeks	Action (remedy work indicated) must be carried out within period of 6 Weeks	13	19%
4	6 Months	Action (remedy work indicated) must be carried out within period of 6 Months	9	14%
5	Compliant	No corrective action required	9	14%
6	Not Applicable	These checkpoints were not applicable to the factory	25	37%
		Total Check Points	67	100%

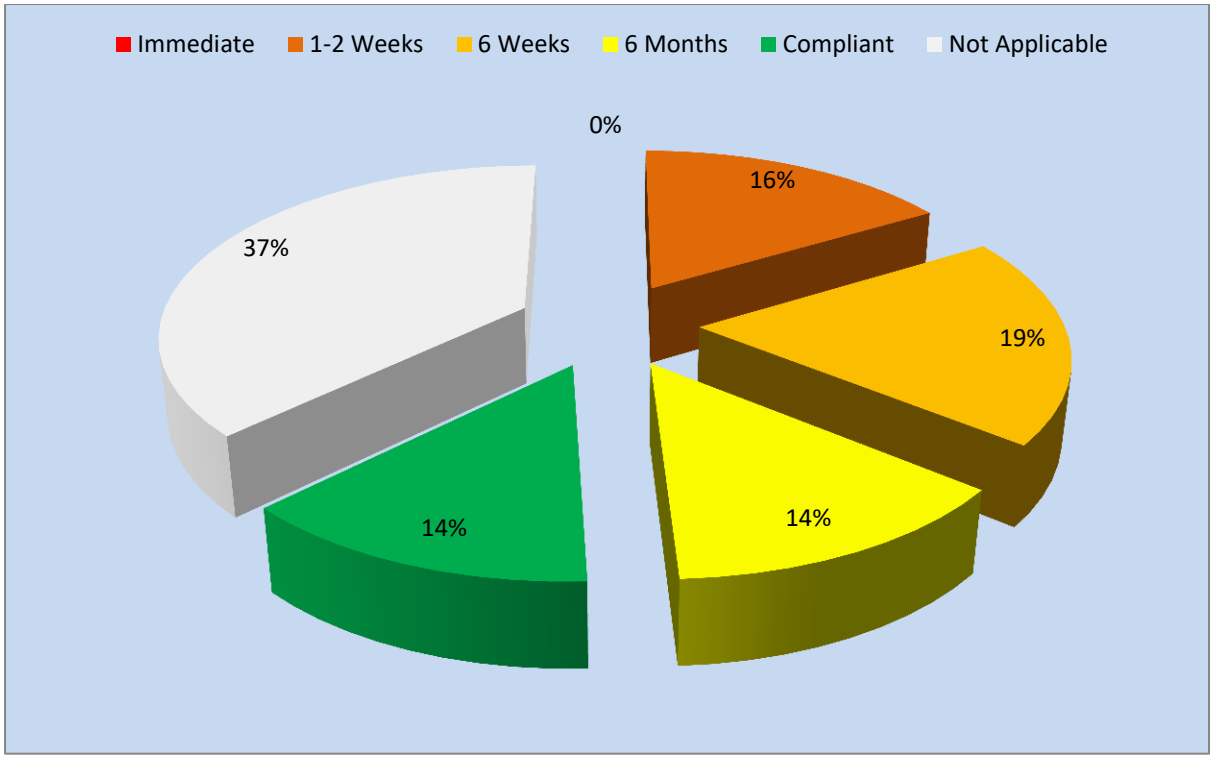


Figure-1: Distribution of Checkpoints

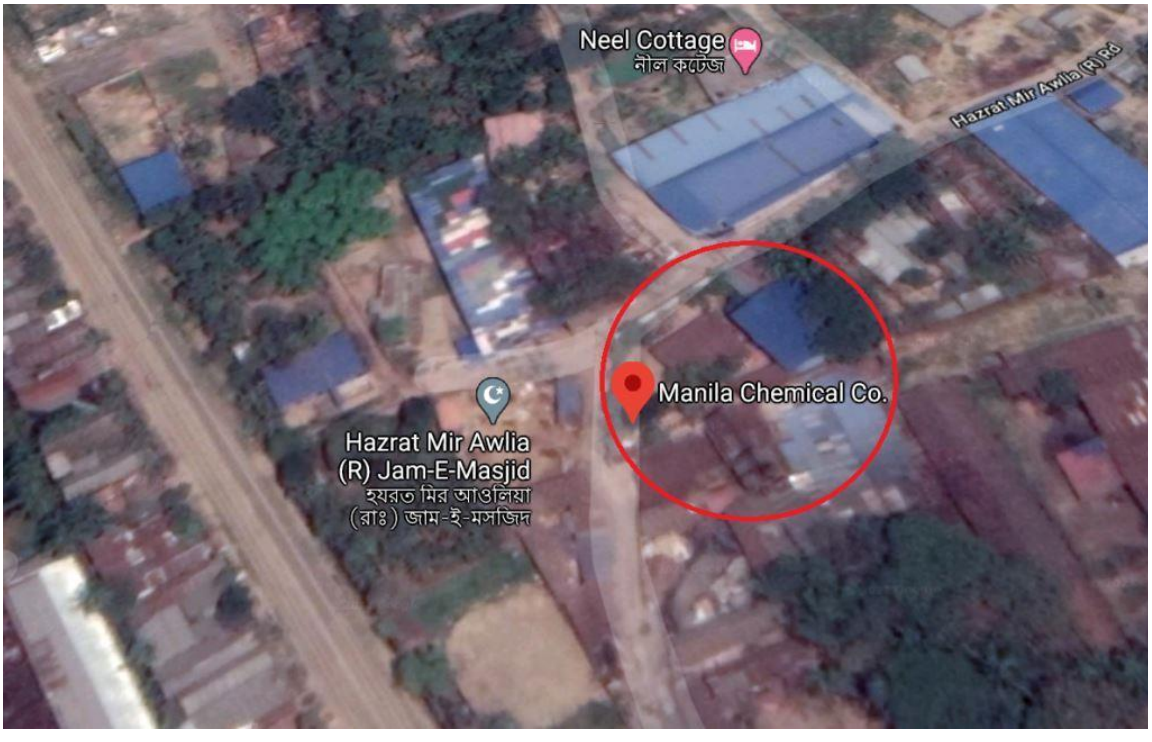
The non-compliances have been prioritized based on the timeline in which the corrective action can be implemented. As seen above, there are **0**% non-compliances which need immediate action. Corrective actions for **16**% of non-compliances need to be implemented in Short term (1-2 Week), whereas **19**% of non- compliances need Mid-term (6 Weeks) for corrective action. **14**% of checkpoints fall under Long term (6 months) category for corrective action. There are **14**% of checkpoints which show general compliance with Bangladesh National Building Code 2020 and other relevant Standards.

General Information

TABLE 2: GENERAL INFORMATION	
Factory Name & Address	**Manila Chemical Company** 2-no Jungle Latifpur, Jafrabad, Shitakundo, Chattogram.
Factory License Number	2630/Chattogram
Date of Inspection	27th & 28th February, 2021
Name of Factory Managing Director	Md. Delowar Hossain
Factory Concern Person Name	Md. Rejaul Karim
Phone number of Contact Person	+88 01928812683
Email Address of Contact Person	mdrejaulkarim1920@gmail.com

Location Map

Co-ordinates: **Latitude [22.37921° N]** **Longitude [91.77305° E]**



Exterior View of Factory Building

View of Office Building

View of Production Shed

View of Godown Shed-1

View of Godown Shed-2

Meeting with Factory Representatives

Factory General Information

TABLE 3: BUILDING INFORMATION						
Building Name	Floor Designation	Area in sft (Floor-wise)	Occupancy Type (Floor-wise)	Type of Construction	Building Height	Construction History
Production Shed (Single Storied)	Ground Floor	1006	J2, H2	Non-rated Shed	17'-0"	2008
Office Building (Single Storied)	Ground Floor	358	E	RCC	9'-0"	2020
Godown Shed-1 (Single Storied)	Ground Floor	1232	J2	Non-rated Shed	11'-6"	2008
Godown Shed-2 (Single Storied)	Ground Floor	2000	J2	Non-rated Shed	22'-0"	2016-2017
Godown Shed-3 (Single Storied)	Ground Floor	360	H2, J2	Non-rated Shed	9'-0"	2016-2017

TABLE 4: MEANS OF EGRESS								
Building Name	Floor Designation	No. of Existing Occupants (Floor-wise)	No. of Stair	No. of exit	Req. total width of exit (mtr.) **BNBC Table 4.3.2**	Measured total width of exit doors (mtr.)	Req. total width of exit stairs (mtr.) **BNBC Table 4.3.2**	Measured total width of exit stairs (mtr.)
Production Shed (Single Storied)	Ground Floor	5	NA	1	0.02	1.2	NA	NA
Office Building (Single Storied)	Ground Floor	3	NA	3	0.012	2.43	NA	NA
Godown Shed-1 (Single Storied)	Ground Floor	0	NA	1	-	2.88	NA	NA
Godown Shed 2 (Single Storied)	Ground Floor	0	NA	1	-	4	NA	NA
Godown Shed-3 (Single Storied)	Ground Floor	0	NA	2	-	1.7	NA	NA

Note: The factory shall maintain minimum width of exit door 1.0 meter as per BNBC- 3.9.3, Page 2890 and also maintain minimum width of stair as per BNBC-Table 4.3.6.

NA: Not Applicable

Factory Layout

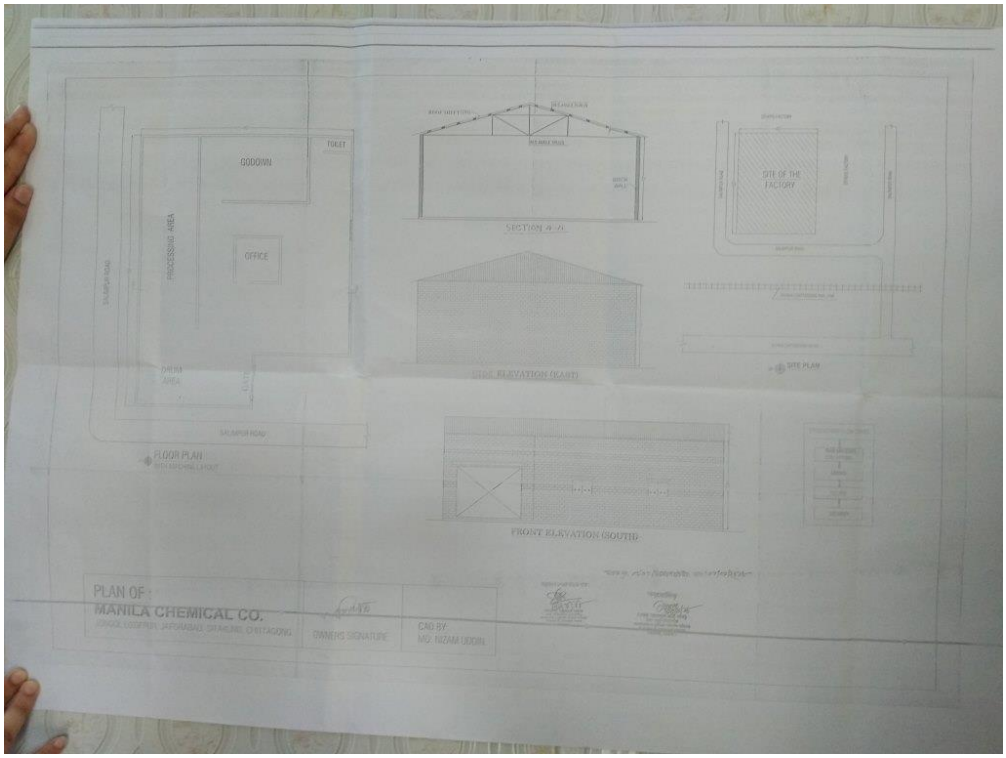
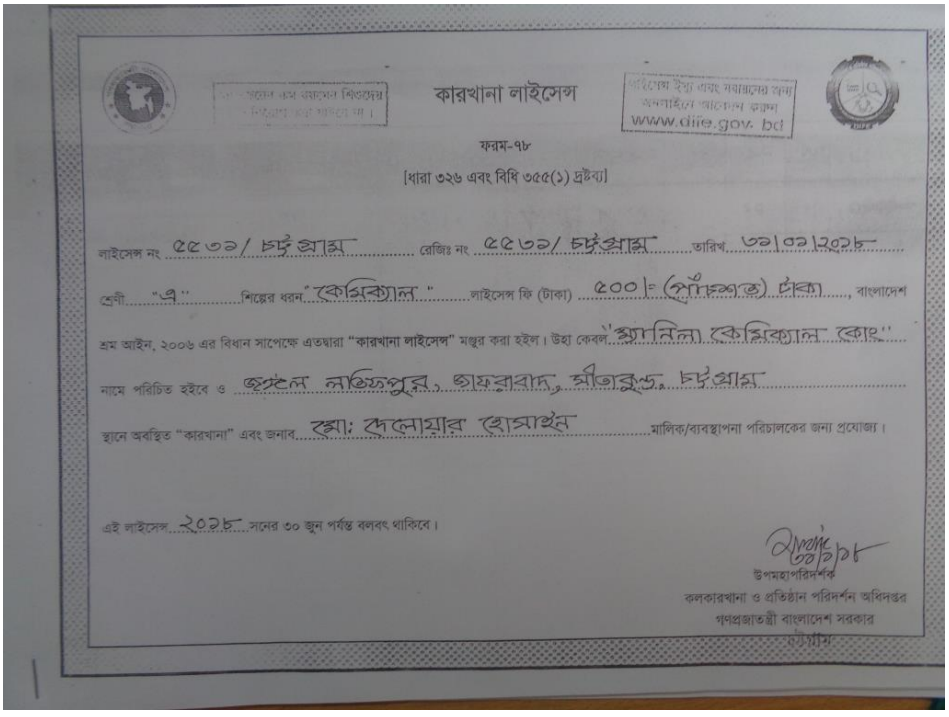


Figure: Factory Layout



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ফরম-৭৮

[ধারা ৩২৬ এবং বিধি ৩৫৫(১) দ্রষ্টব্য]

লাইসেন্স নং ৫৫৩৯/ চট্টগ্রাম রেজিঃ নং ৫৫৩৯/ চট্টগ্রাম তারিখ ৩১/০৩/২০১৮

শ্রেণী "এ" শিল্পের ধরন "কেমিক্যাল" লাইসেন্স ফি (টাকা) ৫০০/= (পাঁচশত) টাকা, বাংলাদেশ

শ্রম আইন, ২০০৬ এর বিধান সাপেক্ষে এতদ্বারা "কারখানা লাইসেন্স" মঞ্জুর করা হইল। উহা কেবল 'ম্যানিলা কেমিক্যাল কোং'

নামে পরিচিত হইবে ও জহুরুল লতিফপুর, জাফরাবাদ, সীতাকুন্ড, চট্টগ্রাম

স্থানে অবস্থিত "কারখানা" এবং জনাব মোঃ দেলোয়ার হোসাইন মালিক/ব্যবস্থাপনা পরিচালকের জন্য প্রযোজ্য।

এই লাইসেন্স ২০১৮ সনের ৩০ জুন পর্যন্ত বলবৎ থাকিবে।

উপমহাপরিদর্শক

কলকারখানা ও প্রতিষ্ঠান পরিদর্শন অধিদপ্তর

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার

Figure: Factory License

Detailed Observations of Non-conformities

The non-conformities have been categorized into following sections. Detailed observations of non-conformities are listed in the relevant sections. Against each non-compliance, the timeline for implementing corrective actions is mentioned on the top-right corner of every point. The summary of the no. of checkpoints in every section against the non-compliances is given in the table below.

Section	No. of checkpoints	No. of non- compliances
Evacuation Pathway	9	5
Stairways	11	0
Discharge Level	3	1
Fire Separation	9	3
Safety Systems	28	22
Management	7	2
Total	**67**	**33**

Evacuation Pathway

1	**Have all evacuation pathways the minimum required width in accordance with the Guideline?**	**1-2 Weeks**
Section	Evacuation Pathway	
Description	During the assessment, we did not find minimum width of evacuation pathway at some area like - exit door of Office Building: 0.81m, passageway of Production Shed: 0.66m, exit door of Godown Shed-3: 0.85m, etc.	
Corrective Action Plan	The factory shall maintain the minimum width of passageways, corridor 1.12 m for industrial area (Occupancy: G1, G2) and 0.915 m for storage area, high hazardous area (Occupancy: H1, H2, J) at the evacuation pathways as per code.	
Reference	**BNBC-3.8.3, Page- 2889 and Table 4.3.8 in Page 2902**	
Pictorial Evidence		

2	**Are all evacuation pathways free of any permanent obstacles?**	**Compliant**
Section	Evacuation Pathway	
Description	During the assessment, we found no permanent obstacles at the evacuation pathways.	
Corrective Action Plan		
Reference	**BNBC- D.7.3, Page- 2812 and Sec 3.4.5 in Page 2884**	

3	**Are all evacuation pathways free of any temporary stored items?**	**1-2 Weeks**
Section	Evacuation Pathway	
Description	During the assessment, temporary stored items were found in evacuation pathways. Location : Production Shed, Godown Shed-1, Godown Shed-2, etc.	
Corrective Action Plan	The factory will remove all temporary stored items from evacuation pathways & ensure all evacuation pathways shall be free from temporary stored item.	
Reference	**BNBC- D.7.3, Page- 2812 and Sec 3.4.5 in Page 2884**	
Pictorial Evidence		

4	**Do all evacuation ramps comply with the maximum allowable slope?**	**NA**
Section	Evacuation Pathway	
Description	Ramps were not available in the factory during the assessment.	
Corrective Action Plan		
Reference	**BNBC- 3.11.1 and 3.11.3**	

5	**Does the maximum travel distance from any location of the floor to nearest emergency exit meet the requirement of code?**	**Compliant**
Section	Evacuation Pathway	
Description	During the assesment we found the following maximum travel distance : 1. Production Shed = 16m. 2. Godown Shed-1 = 15m. 3. Godown Shed-2 = 19.5m. As per above mesurement, the maximum travel distances meet the requrement of the Code.	
Corrective Action Plan		
Reference	**BNBC- Table 4.3.4 and Table 4.3.8**	

6	**Do all floor exit doors and final exit doors swing in the direction of travel?**	**6 Weeks**
Section	Evacuation Pathway	
Description	Exit doors were not swing in the direction of travel and have sliding doors. Location: Production Shed, Godown Shed-1, Godown Shed-2, etc.	
Corrective Action Plan	The factory shall ensure to change existing exit doors on evacuation routes, exit doors with side hinged type door, which swing outward and in the direction of travel.	
Reference	**BNBC- 3.9.5, Page- 2890**	
Pictorial Evidence		

7	**Do the doors in the egress route open easily? Doors cannot be locked at any time in the direction of evacuation.**	**6 Weeks**
Section	Evacuation Pathway	
Description	During the assessment, the doors in the egress route open easily. Sliding doors with locking features were found at building exits, egress routes and exit discharge. Location: Production Shed, Godown Shed-1, Godown Shed-2, etc.	
Corrective Action Plan	Remove all locking device from all egress doors. All exit doors should be open-able from the side they serve without the use of a key.	
Reference	**BNBC- 3.4.3, Page- 2884**	
Pictorial Evidence		

8	**Is the width of emergency exits satisfactory?**	**6 Weeks**
Section	Evacuation Pathway	
Description	During the assessment, the width of emergency exits was not satisfactory. Exit door of Office Building = 0.8m Exit door of Godown Shed-3 = 0.85m	
Corrective Action Plan	Factory shall ensure the emergency exits minimum 1 meter per exit as per code.	
Reference	**BNBC- 3.9.3, Page- 2890**	
Pictorial Evidence	   	

9	**Does the sum of the width of all emergency exits meet the requirement in accordance with the number of occupants?**	**Compliant**
Section	Evacuation Pathway	
Description	TABLE 4: MEANS OF EGRESS, the sum of width of exits meet the requirement in accordance with the number of exiting occupants. However, the factory shall maintain minimum width of exits 1 meter as per code.	
Corrective Action Plan		
Reference	**BNBC- Table 4.3.2, Page- 2887**	

Stairways

10	**Does the number of exits is adequate based on No of occupants per floor?**	**Compliant**
Section	Stairways	
Description	During the assesment, we found the following information: 1. Office Building (i) Ground floor = Total occupant 3, Total exit 3. 2. Production Shed (i) Ground floor =Total occupant 5, Total exit 1. 3. Godown Shed-1 (i)Ground floor=Total occupant 0, Total exit 1. The maximum travel distances of the Production Shed and Godown Shed-1 was 16m and 15m respectively. As per above data, the number of exits was adequate based on No. of occupants per floor.	
Corrective Action Plan		
Reference	**BNBC- 3.14.2, 3.14.3, Table 4.3.4 Page 2890-2891**	

11	**Does the minimum width of stairs meet the requirement of code?**	**NA**
Section	Stairways	
Description	During the assessment, no stair was available in the factory. So this issue is not applicable.	
Corrective Action Plan		
Reference	**BNBC-Table 4.3.6, Bangladesh Labour Rules, 2015, Rules: 54(7)**	

12	**Does the sum of the width of all staircases meet the requirement in accordance with BNBC?**	**NA**
Section	Stairways	
Description	There was no stairway in the factory premises.	
Corrective Action Plan		
Reference	**BNBC- Table 4.3.2, Page- 2887**	

13	**Are handrails provided in all stairways?**	**NA**
Section	Stairways	
Description	There was no stairway in the factory premises.	
Corrective Action Plan		
Reference	**BNBC- 3.10.4, Page- 2895 and 3.10.8 in Page 2897**	

14	**Is the tread/riser relationship consistent on all stairways?**	**NA**
Section	Stairways	
Description	There was no stairway in the factory premises.	
Corrective Action Plan		
Reference	**BNBC- Table 4.3.5, Page- 2893 and 3.10.6, Page- 2896, 1.14.5.2 Page 2651**	

15	**Are internal stairways linking more than two floors fire separated with fire rated walls?**	**NA**
Section	Stairways	
Description	During the assessment, internal stairways were not available in the factory.	
Corrective Action Plan		
Reference	**BNBC- Table 3.3.1 (a) in Page 2749**	

16	**For stairs that require fire separation, are they provided with fire rated self-closing doors?**	**NA**
Section	Stairways	
Description	There was no stairway in the factory premises.	
Corrective Action Plan		
Reference	**BNBC- Table 3.3.1 (a) and Table 3.2.3 and 5.9.2 (c) in Page 2936**	

17	**For stairs that require fire separation (such as high rise buildings, >33m height or >10 floors), are they provided with fire rated entry lobby?**	**NA**
Section	Stairways	
Description	Maximum measured height was 6.7 meter at Godown Shed-2. There was not high rise building in the factory premises.	
Corrective Action Plan		
Reference	**BNBC- 3.13.4, Page- 2900 and 5.9.2 (c) in Page 2936**	

18	**Are stairways free of any obstacles?**	**NA**
Section	Stairways	
Description	There was no stairway in the factory premises.	
Corrective Action Plan		
Reference	**BNBC- D.7.3, Page- 2812**	

19	**Are stairways free of any combustibles?**	**NA**
Section	Stairways	
Description	There was no stairway in the factory premises.	
Corrective Action Plan		
Reference	**BNBC- D.7.3, Page- 2812, Best Practice**	

20	**Is proper protection (e.g. fire rated barriers) provided for exterior stairs so that the exit path is not obstructed?**	**NA**
Section	Stairways	
Description	Exterior Stairs were not available during the assessment.	
Corrective Action Plan		
Reference	**BNBC- 3.10.11, Page-2898**	

Discharge Level

21	**Is discharge floor exit/Premises exit widths based on the number of occupants and minimum allowable width?**	**Compliant**
Section	Discharge Level	
Description	During the assesment we found the following information : Total occupant = 12 Total floor area= 460.4 square meters. Total design occupant load = 46 Required premises exit width = 0.23 meters Measured premises exit width = 4.5 meters As per above information, premises exit widths based on existing occupant load meets the requirements.	
Corrective Action Plan		
Reference	**BNBC- Table 4.3.2, Page-2887 and 3.5.1 in Page 2885**	
Pictorial Evidence		

22	**Do all stairways finish directly to outside or via a fire separated corridor?**	**NA**
Section	Discharge Level	
Description	During the assessment, no stair was available in the factory. So this issue is not applicable.	
Corrective Action Plan		
Reference	**BNBC-3.10.11 in Page 2898, 3.2 Page 2881**	

23	**Are evacuation routes protected from production areas and high risk uses all the way to outside?**	**6 Months**
Section	Discharge Level	
Description	During the assessment, evacuation routes were not protected from high risk uses area (i.e. chemical stores found in the evacuation route).	
Corrective Action Plan	All high risk areas shall be fire separated by rated wall and rated door from the evacuation routes.	
Reference	**BNBC- Table 3.2.1, Page- 2673 and 3.2.2 in Page 2882, Table 3.2.3 Page 2675**	
Pictorial Evidence		

Fire Separation

24	**Are any atria present linking more than two floors? If YES, are the upper floors fire separated from the atria?**	**NA**
Section	Fire Separation	
Description	Atria was not avaiable during the assessment.	
Corrective Action Plan		
Reference	**BNBC- 3.1.19.2(f), Page-2763 and 3.1.19.1 in Page 2762**	

25	**Are any vertical service shafts passing through two or more floors? If YES, are they provided with required fire resistance rating of walls/doors?**	**NA**
Section	Fire Separation	
Description	Vertical service shafts were not available in the factory during the assessment.	
Corrective Action Plan		
Reference	**BNBC- Table 3.3.1(a)**	

26	**Are any mezzanines present? If YES, are travel distances to a protected stairway or final exit within maximum allowable limits?**	**NA**
Section	Fire Separation	
Description	During the assessment, mezzanines were not available in the factory.	
Corrective Action Plan		
Reference	**BNBC- Table 4.3.4 and Table 4.3.8 and 1.14.6 in Page 2651**	

27	**Are all lifts provided with proper fire separation?**	**NA**
Section	Fire Separation	
Description	There was no lift avaiable in the factory during the assessment.	
Corrective Action Plan		
Reference	**BNBC- Table 3.3.1(a), 3.3.1 (b)**	

28	**Does the building have a Basement level? If YES, is it appropriately fire separated with an entry lobby, fire walls and fire rated self-closing doors?**	**NA**
Section	Fire Separation	
Description	Basement level was not available in the factory during the assessment.	
Corrective Action Plan		
Reference	**BNBC- 3.1.8, Page-2757 and BNBC-1.14.11.4 in Page 2652**	

29	**Are Permanent / Designated Storage areas (if adjacent to production area) separated with fire rated walls / doors?**	**6 Months**
Section	Fire Separation	
Description	During the assessment, we found storage areas adjacent to productiom area without fire separation. Location: Production Shed.	
Corrective Action Plan	Storage area (Permanent / Designated) shall be fire separated from the production area by fire rated walls and fire rated doors.	
Reference	**BNBC- Table 3.2.1 in Page 2673**	
Pictorial Evidence	 	

30	**Are all high-risk rooms fire separated from the rest of the operational areas? (Boiler Room, Generator Room, Substation Room, Chemical Room.)**	**6 Months**
Section	Fire Separation	
Description	Chemical stores at Godown Shed-1, Godown Shed-2 and Godown Shed-3 were found without fire separation.	
Corrective Action Plan	Chemical stores shall be fire separated by rated wall and rated door as per code.	
Reference	**BNBC- Table 3.2.1 in Page 2673 and 2.11.7 in Page 2684**	
Pictorial Evidence		

31	**Are any smoke & heat vents required at any atria or storage area?**	**6 Weeks**
Section	Fire Separation	
Description	During the assesment, we found the following information: (i) Chemical store at Godown Shed-1, Godown Shed-2 & Godown Shed-3. Smoke and heat vents were not found at chemical stores and production areas.	
Corrective Action Plan	The factory shall install smoke & heat vent at chemical stores as per code.	
Reference	**BNBC-2.6, Page- 2871 and Table 4.2.1**	

32	**Is there any opening or penetration in slab or wall? If YES, is it properly sealed with appropriate fire rating?**	**NA**
Section	Fire Separation	
Description	During the assessment, opening or penetration in slab or wall was not found.	
Corrective Action Plan		
Reference	**BNBC- Table 3.2.1 & Table 3.3.1(a), 3.3.1 (b) in Page 2673, 2749 and 2.5 in Page 2869**	

Safety Systems

33	**Are all evacuation pathways appropriately sign posted?**	**1-2 Weeks**
Section	Safety Systems	
Description	Aisle marking & exit signage are not provided in all floor operational areas as well as exit doors in the entire factory.	
Corrective Action Plan	Provide aisle marking with arrow guiding and exit signage on all Evacuation pathways or provided with overhead signage fixed at ceiling level. - Illuminated exit sign should be posted above the exit door, - It should be clearly visible at all time, - Provide directional signs wherever necessary. - All exit doors should be clearly marked for easy identification. - Signage should be uniform.	
Reference	**BNBC- 3.16, Page-2902**	
Pictorial Evidence		

34	**Are all evacuation pathways appropriately illuminated with emergency lighting?**	**6 Weeks**
Section	Safety Systems	
Description	Emergency lighting was not provided for all evacuation pathways. Location: Production Shed, Godown Shed-1, Godown Shed-2, Godown Shed-3, Office Building, etc.	
Corrective Action Plan	The factory shall install the emergency lights at evacuation pathways to ensure appropriate illumination as per code.	
Reference	**BNBC- 1.2.7.2(a), Page-4539**	

35	**Are all evacuation stairways appropriately illuminated with emergency lighting?**	**NA**
Section	Safety Systems	
Description	There was no stairway in the factory premises.	
Corrective Action Plan		
Reference	**BNBC- 1.2.7.2(b), Page-4539**	

36	**Is the emergency lighting system provided with back-up power supply?**	**1-2 Weeks**
Section	Safety Systems	
Description	Emergency lighting as well as back-up power supply was not provided for all evacuation pathways. Location: Production Shed, Godown Shed-1, Godown Shed-2, Godown Shed-3, Office Building, etc.	
Corrective Action Plan	The illumination of exit signs and the lighting of the means of escape and exit access shall be powered by an alternate or emergency electrical system to ensure continued illumination for a duration of not less than 30 minutes after the failure of primary power supply.	
Reference	**BNBC-1.2.7.2(c), Page-4539**	

37	**Are detectors provided? Which types of detectors are provided?**	**6 Months**
Section	Safety Systems	
Description	During the assessment, detectors were not provided in the factory. The factory production area hazard condition is chemical hazardous (Occupancy: J) and the area of the Production Shed is 1006 sft, so automatic detection and fire alarm system is required, but automatic fire detectors and alarm system were not provided in the entire factory.	
Corrective Action Plan	Prepare design drawings for the fire detection and alarm system in accordance with the code requirements and hazard situation, (with appropriate specifications and drawings) showing how they will be implemented along with an implementation plan. Install the fire detection and alarm systems in accordance with the code requirements (based on appropriate specifications and design/ drawings).	
Reference	**BNBC- 4.6.1(b), Page- 2923, 5.12 Page 2939**	
Pictorial Evidence		

38	**Is there a manual or automatic fire detection and alarm system that complies with BNBC guidelines?**	**6 Months**
Section	Safety Systems	
Description	Automatic detection & alarm system were not provided in the entire factory. The factory production area hazard condition is chemical hazardous (Occupancy: J) and the area of the Production Shed is 1006 sft = 93.46 sqm, so automatic detection and alarm system is required.	
Corrective Action Plan	Install an automatic fire alarm and detection systems in accordance with the code to fulfill the requirements.	
Reference	**BNBC- PART IV, Appendix C in Page 2957**	

39	**Are the manual activation points appropriately spaced?**	**6 Weeks**
Section	Safety Systems	
Description	The manual activation points were not installed. Location: All buildings & sheds.	
Corrective Action Plan	The manual activation call point should be installed at all exit routes of the building as per design.	
Reference	**BNBC-1.3.37 (BS-5839), Page-4613**	

40	**Does the alarm system covers all floors?**	**6 Weeks**
Section	Safety Systems	
Description	The factory did not install fire alarm system. Location: All buildings & sheds.	
Corrective Action Plan	An automatic alarm system shall be installed throughout the factory as per code.	
Reference	**BNBC- 4.6.2.2, Page-2923**	

41	**Is the number of detectors sufficient for coverage of the production floors and stores as per Standard?**	**6 Weeks**
Section	Safety Systems	
Description	The factory did not install an automatic fire detection and alarm system. As per floor area, floor height and hazard criteria (J) an automatic fire detection and alarm system is required in the factory. Location: All buildings & sheds.	
Corrective Action Plan	The factory shall install fire detection and alarm system which covers the production floors and storage areas, etc. as per code.	
Reference	**BNBC- PART IV, Appendix C in Page 2957**	

42	**Does the factory have provision of periodic checking of alarm call point, alarm & detection system with maintaining record properly?**	**1-2 Weeks**
Section	Safety Systems	
Description	During the assessment, we did not find any alarm call point, alarm and detection system.	
Corrective Action Plan	The factory shall perform periodic checking of alarm call point, alarm & detection system with maintaining record properly after installing the system.	
Reference	**BNBC- A.9.1, Page-2948**	

43	**Are the right numbers of extinguishers present & properly tagged?**	**1-2 Weeks**
Section	Safety Systems	
Description	Right numbers of fire extinguishers were not present in the factory during the assessment. Total area: 460 square meters Total installed extinguisher: 4 Tagged with fill date and expire date were available, but manufactures instructions, checklist, refill data were not available in the factory during the assessment.	
Corrective Action Plan	The factory shall provide right number of fire extinguishers that meet the requirements of the code. Also, ensure regular monitoring and maintenance of extinguishers, including inspection and expiry/re-service labels/refill data. Ensure easy accessibility to fire extinguishers.	
Reference	**Fire Service Rules, 2014; 13th Tofshil, Page- 18527, Labour rules 2015 Page 7340 - 55(2),(3),(4)**	
Pictorial Evidence	 	

44	**Are the extinguishers appropriately spaced?**	**1-2 Weeks**
Section	Safety Systems	
Description	Fire extinguishers were not found at Godown Shed-3. Also, the spacing of fire extinguisher was not maintained properly in some of the areas (i.e. Production Shed, Godown Shed-1, Godown Shed-2, etc.).	
Corrective Action Plan	The factory shall install the extinguishers appropriately, and spaced as per the manufacturer's instructions which will provide the total coverage of the factory.	
Reference	**BNBC-4.4, Fire Service Rules, 2014; 13th Tofshil, Page- 18527**	

45	**Does the factory have dedicated fire pump or hydrant system?**	**6 Months**
Section	Safety Systems	
Description	Fire pump or hydrant system was not available in the factory.	
Corrective Action Plan	The factory shall take an initiative dedicated fire pump or hydrant system - Prepare, design, drawing of the fire pump system or hydrant system based on hazard criteria also hydraulic calculation of the system which meet the requirement and will be installed pump system follow NFPA-20 guideline as per code.	
Reference	**BNBC- 5.9.2(o) & (p), Page -2937, 5.12 Page 2939 , 5.10 Page 2938**	

46	**Does the dedicated fire pump or hydrant system have alternative power backup?**	**6 Weeks**
Section	Safety Systems	
Description	Fire pump or hydrant system was not available in the factory.	
Corrective Action Plan	The factory shall prepare design & drawing of the dedicated fire pump system with alternative power backup & shall be installed as per code.	
Reference	**BNBC- 4.2.2.5, Page-2909**	

47	**Does the factory have provision of periodic checking of fire pump or hydrant system with maintaining record properly?**	**1-2 Weeks**
Section	Safety Systems	
Description	Fire pump or hydrant system was not available in the factory.	
Corrective Action Plan	After completing installation of fire pump or hydrant system factory shall maintain a periodic checking and maintaining record properly.	
Reference	**BNBC-4.2.12.3, Page- 2918**	

48	**Does the number of hose meet the requirement of code in all floors?**	**6 Months**
Section	Safety Systems	
Description	The factory did not install the fire hose system in the factory premises.	
Corrective Action Plan	The factory shall prepare proper design and plan also demonstrate it. Install required number of hose which meet the requirements of the code in all floor areas.	
Reference	**BNBC- 4.2.3, Page-2910**	

49	**Does the diameter of first aid hose and standpipe meet the requirement of code?**	**6 Weeks**
Section	Safety Systems	
Description	During the assessment, we did not find first aid hose and standpipe system within the factory.	
Corrective Action Plan	The factory shall ensure the hose connection to a standpipe for large stream shall be at least 100 mm nominal and that of small stream may be 63 mm or 50 mm on each point. The size of first aid hose shall be 38 mm nominal. The hose length shall not be more than 30 m.	
Reference	**BNBC- 4.2.3.11, Page-2913**	

50	**Is the performance of hose (water pressure) satisfactory?**	**6 Months**
Section	Safety Systems	
Description	During the assessment, hose system was not available in the factory.	
Corrective Action Plan	The minimum pressure for standpipes supplying a 50 mm or larger diameter hose shall be at least 300 kPa. For standpipe supplying first aid hose (38 mm nominal diameter) may have a minimum pressure of 200 kPa.	
Reference	**BNBC- 4.2.3.3, Page-2911**	

51	**Is the standpipe and first aid hose performance being checked periodically and tagged properly?**	**1-2 Weeks**
Section	Safety Systems	
Description	Standpipe and hose system were not available in the factory.	
Corrective Action Plan	The factory shall maintain testing, inspection and maintenance documents of standpipe and first aid hose system periodically after installing the system.	
Reference	**BNBC- 2.4.4.1, Page-2676 and 4.2.2.4 in Page 2908**	

52	**Does the factory have sufficient water capacity connected to hose to supply water during peak demand period?**	**6 Months**
Section	Safety Systems	
Description	The factory did not have dedicated water reservoir sufficient capacity.	
Corrective Action Plan	Prepare plan and design for dedicated water storage tank & construct it which meets the peak demand period firefighting.	
Reference	**BNBC- Table 4.4.1, Page-2905**	

53	**Is a fire-fighting lift provided in high rise (above 33m) buildings?**	**NA**
Section	Safety Systems	
Description	There was no high rise building in the factory premises.	
Corrective Action Plan		
Reference	**BNBC- 2.11, Page- 2876**	

54	**Are fire-fighting truck access roads wide enough and free of obstacles?**	**Compliant**
Section	Safety Systems	
Description	Fire-fighting truck access roads were wide enough and free of obstacles.	
Corrective Action Plan		
Reference	**BNBC- 1.7, Page-2633**	
Pictorial Evidence		

55	**Are fire-fighting additional equipment provided at the right location? Sand, water, buckets, etc.**	**Compliant**
Section	Safety Systems	
Description	During the assessment, we found additional fire fighting equipment like sand, water, bucket, etc. in the factory premises.	
Corrective Action Plan		
Reference	**Bangladesh Labour Rules, 2015, rules 55(1)**	
Pictorial Evidence		

56	**Is a Fire Command Station provided at Ground floor in high rise buildings?**	**NA**
Section	Safety Systems	
Description	There was no high rise building in the factory premises.	
Corrective Action Plan		
Reference	**BNBC- A.5.5,Page-2945**	

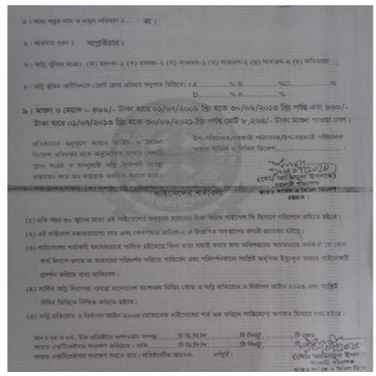
57	**Is/Are there P. A. (Public Address) system/s which is/are audible from all corner/s of factory?**	**6 Weeks**
Section	Safety Systems	
Description	P.A. (Public Address) system was not available in the factory.	
Corrective Action Plan	The factory shall prepare design for P. A. (public address) system such a way that is having communication to all floors as well as facilities to receive messages from all floors also install the system which meets the requirement of the code.	
Reference	**BNBC-3.15.2, Page-4746**	

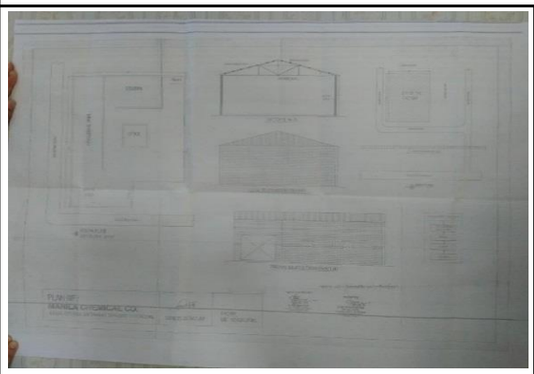
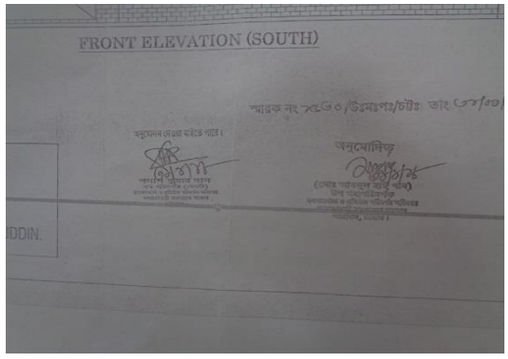
58	**Are there combustible materials found near heat/ electrical source (near DB, SDB and electrical installations, loose electrical connection) in store or production floor?**	**1-2 Weeks**
Section	Safety Systems	
Description	During the assessment, combustible materials were found near the electrical source. Location: Production Shed.	
Corrective Action Plan	The factory shall remove all the flammable material in front of the electrical circuitry of distribution panels.	
Reference	**Best Practice**	
Pictorial Evidence		

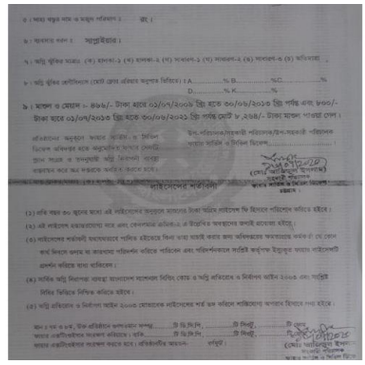
59	**Is there back-up power supply provided for the alarm system? Battery, IPS, etc.**	**6 Weeks**
Section	Safety Systems	
Description	The factory did not install fire alarm and detection system yet.	
Corrective Action Plan	The factory shall provide back-up power supply for a control panel of fire alarm and detection system after installing the system.	
Reference	**Best Practice**	

60	**Is the visual alarm placed in working condition where required?**	**NA**
Section	Safety Systems	
Description	During the assessment, we did not find any occupying area where the ambient noise above 90 dBA. So, visual alarm is not require as per present conditions.	
Corrective Action Plan		
Reference	**BNBC-1.3.37, Page- 4613 and 4.6.2.1(b) in Page 2923**	

Management

61	**Does the factory have the valid Fire License/ permit?**	**Compliant**
Section	Management	
Description	During the assessment, Fire license was available and up to date in the factory.	
Corrective Action Plan		
Reference	**Best Practices**	
Pictorial Evidence		

62	**Does the factory building approval from authority?**	**6 Weeks**
Section	Management	
Description	During assesment, we found the following information from the factory: (i) Building approval drawing was not available from the local authority. (ii) Building layout plan was approved from DIEF.	
Corrective Action Plan	The factory shall prepare update layout plan and take approval from local authority.	
Reference	**Best Practices**	
Pictorial Evidence		

63	**Are all production units/ floors covered in fire license?**	**Compliant**
Section	Management	
Description	During the assessment, fire lisence was available & updated at the name of factory address but no floor area mentioned.	
Corrective Action Plan		
Reference	**Best Practices**	
Pictorial Evidence		

64	**Does the factory have single fire safety management system in case of multi tenancy?**	**NA**
Section	Management	
Description	There was no multi tenancy in the factory.	
Corrective Action Plan		
Reference	**Best Practices**	

65	**Does the factory have boiler license?**	**NA**
Section	Management	
Description	During the assessment, Boiler was not available in the factory.	
Corrective Action Plan		
Reference	**Best Practices**	

66	**Does the factory have boiler operator license?**	**NA**
Section	Management	
Description	During the assessment, Boiler was not available in the factory. So boiler operator license is not applicable.	
Corrective Action Plan		
Reference	**Best Practices**	

67	**Does the factory conduct fire drill regularly covering all shifts maintaining record properly?**	**1-2 Weeks**
Section	Management	
Description	During the assessment, factory authority did not show any documents about fire drill and maintaining records.	
Corrective Action Plan	Fire drill shall be conducted as detailed under the fire safety plan. The frequency of fire drill shall be as per BNBC Table 4.A.1. All occupants of the buildings, building service employees including fire safety and evacuation plan staff shall participate in the fire drill. A record of such drills shall be kept in writing for at least 3 years for the inspection Department of Fire Service and Civil Defence whenever called for.	
Reference	**BNBC-Table 4.A.1 in Page 2947**	

DIFE Summary

Name of Factory	**Manila Chemical Company**
Address of Factory	2-no Jungle Latifpur, Jafrabad, Shitakundo, Chattogram.
Present Status	Under Operation
Fire Assessment conducted by	Aipro Engineering and Consultancy Service
Date of Inspection	27th & 28th February, 2021

Recommendations for Corrective Action

Immediate:

- No corrective actions

Short Term (1-2 Weeks):

- The factory shall maintain the minimum width of passageways, corridor 1.12 m for industrial area (Occupancy: G1, G2) and 0.915 m for storage area, high hazardous area (Occupancy: H1, H2, J) at the evacuation pathways as per code.
- The factory will remove all temporary stored items from evacuation pathways & ensure all evacuation pathways shall be free from temporary stored item.
- Provide aisle marking with arrow guiding and exit signage on all Evacuation pathways or provided with overhead signage fixed at ceiling level.
- - Illuminated exit sign should be posted above the exit door,
- - It should be clearly visible at all time,
- - Provide directional signs wherever necessary.
- - All exit doors should be clearly marked for easy identification.
- - Signage should be uniform.
- The illumination of exit signs and the lighting of the means of escape and exit access shall be powered by an alternate or emergency electrical system to ensure continued illumination for a duration of not less than 30 minutes after the failure of primary power supply.
- The factory shall perform periodic checking of alarm call point, alarm & detection system after installation with maintaining record properly.
- Provide right number of fire extinguishers that meet the requirements of the code. Ensure regular monitoring and maintenance of extinguishers, including inspection and expiry/re-service labels/refill data. Ensure easy accessibility to fire extinguishers.

- The factory shall install the extinguishers appropriately, and spaced as per the manufactures instructions which will provide the total coverage of the factory.
- After completing installation of fire pump or hydrant system factory shall maintain a periodic checking and maintaining record properly.
- The factory shall maintain testing, inspection and maintenance documents of standpipe and first aid hose system periodically after installing the system.
- The factory shall remove all the combustible material in front of the electrical circuitry of distribution panels.
- Fire drill shall be conducted as detailed under the fire safety plan. The frequency of fire drill shall be as per BNBC Table 4.A.1. All occupants of the buildings, building service employees including fire safety and evacuation plan staff shall participate in the fire drill. A record of such drills shall be kept in writing for at least 3 years for the inspection Department of Fire Service and Civil Defence whenever called for.

Mid Term (6 Weeks):

- The factory shall ensure to replace existing exit doors on evacuation routes, exit doors with side hinged type door, which swing outward and in the direction of travel.
- Remove all locking device from all egress doors. All exit doors should be open-able from the side they serve without the use of a key.
- Factory shall ensure the emergency exits minimum 1 meter per exit as per code.
- The factory shall install smoke & heat vent at chemical stores and production areas as per code.
- The factory shall install the emergency lights at evacuation pathways to ensure appropriate illumination as per code.
- The manual activation call point should be installed at all exit routes of the building as per design.
- An automatic alarm system shall be installed throughout the factory as per code.
- The factory shall install fire detection and alarm system which covers the production floors and storage areas, etc. as per code.
- The factory shall prepare design & drawing of the dedicated fire pump system with alternative power backup & shall be installed as per code.
- The factory shall ensure the hose connection to a standpipe for large stream shall be at least 100 mm nominal and that of small stream may be 63 mm or 50 mm on each point. The size of first aid hose shall be 38 mm nominal. The hose length shall not be more than 30 m.
- The factory shall prepare design for P. A. (public address) system such a way that is having communication to all floors as well as facilities to receive messages from all floors also install the system which meets the requirement of the code.
- The factory shall provide back-up power supply for a control panel of fire alarm and detection system after installing the system.

- The factory shall prepare update layout plan and take approval from local authority.
-

Long Term (6 Months):

- The factory shall ensure the sum of the width of emergency exits Office Building (Minimum 1m per exit) as per code.
- All high risk areas shall be fire separated by rated wall and rated door from the evacuation routes.
- Storage area (Permanent / Designated) shall be fire separated from the production area by fire rated walls and fire rated doors.
- Chemical stores shall be fire separated by rated wall and rated door as per code.
- Prepare design drawings for the fire detection and alarm system in accordance with the code requirements and hazard situation, (with appropriate specifications and drawings) showing how they will be implemented along with an implementation plan. Install the fire detection and alarm systems in accordance with the code requirements (based on appropriate specifications and design/ drawings).
- Install an automatic fire alarm and detection systems in accordance with the code to fulfill the requirements.
- The factory shall take an initiative dedicated fire pump or hydrant system - Prepare, design, drawing of the fire pump system or hydrant system based on hazard criteria also hydraulic calculation of the system which meet the requirement and will be installed pump system follow NFPA-20 guideline as per code.
- The factory shall prepare proper design and plan also demonstrate it. Install required number of hose which meet the requirements of the code in all floor areas.
- Prepare a proper design and plan for the Standpipe and hose system. The factory shall install standpipe & hose system which will comply with the code requirements for supply of water with required pressure at top most hose connections.
- Prepare plan and design for dedicated water storage tank & construct it which meets the peak demand period firefighting.

Disclaimer

This report is intended to serve the Company in helping to understand the current safety conditions under the prevailing system and proposed changes that will help improve the safety and reliability of the systems installed at the Company's facility. At the time of the audit/ survey, all the systems were working as intended, as produced by the Company to the auditors. The above result reflects AIPRO Engineering & Consultancy Service's findings at the time and place of inspection.

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