

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Uranus Apparels Ltd.
Address of the Factory	: Municipal Super Market, (4th & 5th Floor), 520/523 Station Road, Chittagong, Bangladesh.
Present Status of the Factory	: Under Operation.
Structural Assessment Conducted by	: TUV
Date of Structural Inspection	: 25 th March, 2015
Fire Assessment Conducted by	: TUV
Date of Fire Inspection	: 25 th March, 2015
Electrical Assessment Conducted by	: TUV
Date of Electrical Inspection	: 25 th March, 2015
BGMEA Membership No.	: 2566.

BASIC INFORMATION:

The assessed factory building was a 6 Storey RCC building and had a truss shed on the 5th floor roof. Uranus Apparel Ltd. occupies the 4th, 5th and the shed-roof floors of the building on a rental basis. The ground floor - 3rd floor of the building is occupied by a shopping center. The structural system of the building is RCC beam column frame and beam slab floor system. The following general information were noted:

i. Building Usage Type	: Garment factory.
ii. Structural System	: RCC beam column frame system.
iii. Floor System	: RCC beam slab floor system.
iv. Floor Area	: The typical plinth area of 6 storey RCC building is 4958 sft. Total operational area is 34706 sft.
v. No. of Stories	: 6 Storey plus shed on 5th floor roof.
vi. Construction Year	: 1983 (1st phase- RCC), 2007 (2nd phase- Tin shed)
vii. Foundation Type	: Spread foundation considered as per foundation design drawing.
viii. Design Drawings	: Unavailable.
ix. Soil Investigation Report	: Available.
x. Construction Materials	: Brick aggregate.
xi. Generator	: North-west corner side of ground floor.

RECOMMENDATIONS FOR CORRECTIVE ACTION:

The recommendations of corrective action for both Structural and Fire & Electrical Safety comprises in Short Term, Mid Term and Long Term basis.

The recommendations for **Structural Safety** corrective action are:

Short Term (Immediate)	: None.
Mid Term (6-weeks)	: <ul style="list-style-type: none">As built architectural and engineering drawings to be prepared for entire building and submitted for approval by appropriate authorities. As part of this process the building engineer will be required to make a number of checks on the structural design.
Long Term (6-months)	: <ul style="list-style-type: none">Building Engineer needs to check the reduced portion of beam and suggest a corrective and remedial action.

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The recommendations for **Fire & Electrical Safety** corrective action are:

(A): Recommendations for Fire Safety corrective actions:

<p>Immediate</p> <p><i>(the factory should not continue to be occupied until these non-conformities have been rectified):</i></p>	<ul style="list-style-type: none"> • None.
<p>Short Term</p> <p><i>(Actions that must be incorporated into a Fire Safety Management Plan immediately (1 ~ 2 weeks) and should be a regular activity</i></p>	<ul style="list-style-type: none"> • Remove all temporary items from all escape routes, aisles and passageway. • Factory management should be checked alarm call points, alarm & detection system periodically and maintained the record properly.
<p>Mid Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 weeks)</i></p>	<ul style="list-style-type: none"> • Replace all existing exit doors on evacuation routes, exit doors with side hinged type door, which swing outward and in the direction of travel. Swinging of the door should not constrict the width of the corridor / passage below 0.9 meter. • Remove all locking device from all egress door. All exit doors should be open-able from the side they serve without the use of a key. • Provide handrails on both side of each stairway with height of 0.9m measured from the nose of stair to the top of the handrail. • Doors in stair should be outward opening, side-swing, self-closing, non-lockable 2 hour fire rated doors in all stair way encloses. • Prepare design for installation of fire rating smoke proof enclosure. 2 hours fire rating doors for exit should not be less than that of 4 hours fire resistance rating of the walls of the smoke proof fire rated entry lobby. • Prepare proper plan and design for 1 hour fire rating separated corridor at ground floor. • Prepare proper plan and design for 4 hour fire rated barriers with 2 hour fire rated doors at 4th floor boiler room, which located at the adjacent to production area. • Produce design and plan for automatic detection system with automatic fire alarm. • Provide adequate nos. of smoke detectors to cover the whole factory building.

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	<ul style="list-style-type: none"> • Prepare proper design and plan to install dedicated fire pump with alternate backup power supply. • Prepare plan and design to provide dedicated water storage tank for firefighting operation. • Prepare proper design and plan to install fire lifts equipped with approved intercommunication (including two way voice communications) with the fire command station or control room on the ground floor lobby of the building. • Complete full design and plan for providing fire command station equipped with detailed floor plans along with clearly demarcated locations of fire detection and fighting devices and through the panel board able to detect fire alarm from any floor. • Obtain building approval from issuing authority • Cover all units / floors in a valid fire license • Implement to a single fire safety management system with approvals from all tenants in the factory building.
<p>Long Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 months)</i></p>	<ul style="list-style-type: none"> • Install smoke proof fire rated entry lobby at emergency stairways to separate from the area of incidence. • All stairway to have direct access to any designated refuge area which requires 1 hour fire rated construction at ground floor for fire separated corridor to finished directly to outside. • Provide 4 hour fire rated barriers with 2 hour fire rated doors at 4th floor boiler room, which located at the adjacent to production area. • Install automatic detection system with automatic fire alarm. • Install dedicated fire pump with alternate backup power supply. • Provide dedicated storage tank for firefighting operation. • Install fire lifts equipped with approved intercommunication (including two way voice communications) with the fire command station or

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	<p>control room on the ground floor lobby of the building.</p> <ul style="list-style-type: none"> • Provide fire command station equipped with detailed floor plans along with clearly demarcated locations of fire detection and fighting devices and through the panel board able to detect fire alarm from any floor.
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(B): Recommendations for Electrical Safety corrective actions:

<p>Immediate</p> <p><i>(the factory should not continue to be occupied until these non-conformities have been rectified):</i></p>	<ul style="list-style-type: none"> • Over current protection devices (Circuit breakers) should be installed at all distribution panels.
<p>Short Term</p> <p><i>(Actions that must be incorporated into a Fire Safety Management Plan immediately (a week) and should be a regular activity</i></p>	<ul style="list-style-type: none"> • Re-locate oil / fuel tanks away from control panels in generator room. • All strands cables at exposed ends should be properly soldered / crimped and insulated. • 1. Disconnect the loads from cable of signs of overloading / abnormal temperature found. • 2. Make necessary repairs to avoid further accidents.
<p>Mid Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 weeks)</i></p>	<ul style="list-style-type: none"> • All unwanted materials should be removed from transformer / Generator room. • Provide rubber mats of adequate size in front of all distribution panels. • Install smoke detection and provide firefighting equipment in the substation and generator room. • Individual Fuse protection should be provided to every 15/20 a socket. • 1. Overhead service connections should be covered and meet the requirements mentioned in RMG Guidelines. • 2. Provide supports for main service line complete with adequate insulation. • The electrical panels to be of metal case and should be marked with “Danger 415 Volts” and identified with proper phase marking and danger signage. • Provide cable connections with properly soldered / welded lugs at (LT/MDB/DB/SDB)'s. Ensure that all the electrical connections are properly secured with lugs

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	<p>and glands.</p> <ul style="list-style-type: none"> • Avoid looping and bunch of cable at MCCB/MCB or bus bar terminal, use individual circuit and over current device for every incoming and outgoing circuit at the distribution boards. • Provide circuit diagram /circuit list with proper current ratings and fuse size, marking for DBs identifying end use load, voltage, number of phases. • Provide cable joints of porcelain / PVC connectors with PIB tape wound around before placing the cable in the box. • Seal the cable penetrations through walls adequately with fire resistive elements. • Provide proper separate earthing/grounding to generator. Ensure that generator body frame to have two separate and distinct connections to the earth / ground. • Provide separate earthing connection to electrical equipment's. Ensure that earth potential provided for all parts of equipment / installation (other than live parts) and that continuous earth connection is provided back to the main intake supply earth. • Provide adequate earthing to body and doors to all MDBs / DB s. Ensure that all electrical panels provided with proper and separate earth potential.
<p>Long Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 months)</i></p>	<ul style="list-style-type: none"> • 1. Provide updated Electrical layout drawing prepared after proper locations of all outlets for lamps, fans, fixed and transportable appliances, motors etc. • 2. Drawings to indicate exact positions of all points of switch boxes and other outlets to match existing installation. • 3. As built drawing to be approved by the engineer-in-charge. • Provide 4 hour fire rated walls all around the transformer / generator room on ground level. • Modify Area of generator room to meet requirements of Table 4.4, RMG Guideline; the area should be.....m2, or relocate the generator room.

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	<ul style="list-style-type: none">• Provide and maintain proper clearance in all sides of generator for ease of maintenance.• Provide calibrated Ammeters / Voltmeters at distribution boards (LT/MDBs).• Power cables/ telecommunication cables / antenna cables should be laid separately.• Each circuit should have a separate neutral (use of common neutral for more than one circuit shall not be permitted).• Seal the cable entry-exit points of (LT/MDB/DB/SDB)'s with non-flammable materials. In addition:<ol style="list-style-type: none">1. Ensure that HT / LT panels / Switchgears to be vermin / damp proof.2. Ensure all unused holes / openings in DBs to be blocked properly.• <ol style="list-style-type: none">1. Provide the ECC to meet minimum cross-sectional area as per table 4.5.2. Ensure that connections between conductors / equipment's provided to durable electrical continuity and adequate mechanical strength and protection.3. The continuous earth connection is provided back to the main intake supply earth.• Provide adequate protection against lightning depending on the probability of a strike and acceptable risk levels at roof top of building.
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