Safety issues caused by human factors in the Nigerian telecommunication industry

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Abstract. Safety is one of the foremost objectives and standard of any organization or industry in any country or nation, hence as such there is an inherent need to understudy how human factors have led to safety issues in the Nigerian Telecommunication industry today. Based on this knowledge this study will take an exploratory review into ways of preventing safety issues caused by human factors in the Nigerian telecommunication industry and find ways of reducing such occurrences to the barest minimum. This study will be conducted using relevant literature reviews from databases such as Scopus, Science direct, Taylor and Francis online and not to mention a few more. Findings from this study will aid the Nigerian Telecommunication industry by providing deep and valuable insight to ways of preventing avoidable safety issues related or caused by human factors. This study will also aid by adding to the body of knowledge on safety issues in organizations and industry across the African continent.

Keywords: Safety, Human factor, Telecommunication industry, Nigeria

1. Introduction
The telecommunication industry today is a constant driver for technological advancement, this is due to the amount of information passed from one point to another [1,2]. For most telecommunication operators in the telecommunication industry to keep meeting daily demands the industry must expand and grow further. This means more building of telecommunication base station towers and radio transceiver sites need to continue across the nation [3]. The base stations and tower or collocated sites require the installations of hardware (antennae and radio equipment) and software applications across the corners of the nation for effective network transmission [4]. To affect this expansion the telecommunication industry will require man power i.e. humans in managing day to day operations required to keep the industry up and running [5]. This operation includes not just the administrative parts but installation and maintenance of new and upgraded technologies as well as maintenance of technologies still in place for network transmission from end to end or point to point [6]. Examples of such operations are tower and base station installation and maintenance, installation and maintenance of antennae and radio equipment on telecommunication sites, installation of optical fibre, wireless equipment, vsat equipment etc [7].

In today’s world of safety first being the foremost objective, standard rule or policy for any organization and industry to be operating and functioning properly [8]. Safety has been termed first and foremost in every daily operation on sites by most telecommunication industries in the world. Since the telecommunication industry utilizes humans for daily operations there would be safety issues caused by human errors and factors that need be addressed to avoid costly accidents or unfixable errors in the Nigerian telecommunication industry today or a loss to the service providers in the nation [7,9,10].
2. **Overview on Safety Issues Caused by Human Factors in the Telecommunication Industry**

Table 1 shows a comprehensive of safety issues caused by human factors as reviewed from existing body of knowledge which are applicable to the telecommunication industry.

**Table 1. Safety Issues Caused by Human Factors**

| S/N | Issue caused by human factor                                                                 | Authors |
|-----|---------------------------------------------------------------------------------------------|---------|
| 1   | Lack of communication by telecommunication engineer or project team caused by assumptions that other members have an idea what should be done and how. | [11,12] |
| 2   | Complacency caused by over confidence due to repeated undergoing of the same task regularly forgetting that telecommunication equipment are different as designed by the equipment vendor. | [13,14] |
| 3   | Lack of knowledge on the job caused by inadequate training on the telecommunication equipment installed | [15]    |
| 4   | Distractions on the job whilst either climbing a tower or working on an antenna, installation of a radio equipment or cables and their maintenance | [16]    |
| 5   | Lack of teamwork between the telecommunication engineers in completing a set goal during installation. | [17]    |
| 6   | Fatigue caused by physical exhaustion or mental stress while on a telecommunication site. | [18]    |
| 7   | Lack of resources especially when operation and maintenance is outsourced, leading to a rush job or not enough man power for said job which results in cut corners to achieve deliverable. | [19–21] |
| 8   | Pressures caused by timeline for maintenance, operational deliverables and key performance indicators on a telecommunication site | [22,23] |
| 9   | Lack of assertiveness or authority speaking to site engineers by site telecommunication supervisor on instructions, orders or actions done by others. | [24]    |
| 10  | Inability to manage stress from home, finance and so on when at work on a telecommunication site. | [25–27] |
| 11  | Inability to recognize a problem, challenge, understand it and proffer possible solutions caused by total lack of awareness on the telecommunication site. | [28]    |
| 12  | Following norms of unwritten behaviors but expected outcomes in a telecommunication site or installation. | [28],[16] |
| 13  | Deliberate nonchalance to use of certified safety equipment’s and kits. | [29–31] |

3. **Overview on prevention of safety issues caused by human factors in the telecommunication industry**

The Nigerian telecommunication industry can learn from reviews done in other developed countries on solutions to prevent safety issues caused by human factors in the industry. Some of the major areas where there are bound to be issues of human errors are installations done on tower [16]. Fatigue or stress not being identified in the workplace is also a big red flag that can be prevented using simple solutions [18]. Safety has always been an issue in foreign countries as well and there are safety violation actions on ways to prevent such from recurring [28,30]. Examples of ways to prevent such safety issues by human factors in the telecommunication industry in Nigeria is to use the below table lists compiled in Table 2 using existing literature.

**Table 2. Prevention of Safety Issues Caused by Human Factors [16,18,28,30–35]**

| S/N | Issue | Prevention |
|-----|-------|------------|
| 1   | Communication | • Ensure use of checklist  
|     |   | • Have pep talks on important details and tasks at the beginning of work and repeat at end for confirmation. |
| 2   | Complacency | • Always anticipate errors.  
|     |   | • Recommend use of checklist as being mandatory and normal  
|     |   | • Use people’s mistakes as corrections to avoid repetitions |
### Prevention

| S/N | Issue                        | Prevention                                                                 |
|-----|------------------------------|---------------------------------------------------------------------------|
| 3   | Knowledge                    | • Never sign something you don’t understand or have not done               |
|     |                              | • Get adequate training and experience                                    |
|     |                              | • Update yourself with latest technological upgrades or via new equipment manuals for familiarity |
|     |                              | • Ask when you are confused or not aware of something                     |
| 4   | Distraction                  | • Always go back to cross check when you are not sure                     |
|     |                              | • Using a checklist in detail step by step on operation serves as a good reminder |
| 5   | Teamwork                     | • Carry work/telecommunication project team along all via tasks and ask for inputs. |
|     |                              | • Discuss openly tasks that need be performed                             |
|     |                              | • Ensure everyone understands and agree on task assigned                  |
|     |                              | • Create trust amidst team                                               |
| 6   | Fatigue                      | • Have other team members cross check work using an accredited checklist   |
|     |                              | • Look out for symptoms linked with fatigue amongst one another           |
|     |                              | • in a telecommunication project site and work environment                |
| 7   | Resources                    | • Get adequate resources to achieve said task at required deliverable time |
| 8   | Pressure                     | • Plan each task according to required resource                           |
| 9   | Assertiveness/Authority      | • Reduce burden by sharing problem to team lead or colleagues              |
|     |                              | • Ask for extra help if need be                                           |
| 10  | Stress                       | • Learn to express concerns in a productive manner and proffer solutions  |
|     |                              | • Resolve issues a step at a time as they arise                           |
|     |                              | • Use clear and audible authoritative commands and reiterate consequence of noncompliance. |
| 11  | Awareness                    | • Learn to manage personal stress before it affects your work or operations at a telecommunication site |
|     |                              | • Always ensure your team takes mandatory breaks during site operations or maintenance |
|     |                              | • If problems are psychological or mentally stress induced, kindly have them consult with a professional to talk with. |
| 12  | Norms                        | • Ensure you understand the step by step operational procedure for a task on a telecommunication project or site |
|     |                              | • Ensure there are no conflicts between a repair to be conducted or a modification that need be done |
| 13  | Deliberate nonchalance       | • Recall that existing norms do not make a procedure right, hence follow outlines on good safety procedures on site |
|     |                              | • Identify and negate negative norms from telecommunication members and operational team |
|     |                              | • Offenders when caught should be penalized severely to act as deterrent for futuristic acts |
|     |                              | • There should always be an HSE officer on site ensuring compliance.       |

### 4. Lessons Learnt

As observed from constant reviews above, having a standard accredited checklist that would be continually updated as system upgrades take place adequately prevents issues on safety that can result from human factors causing accidents and probable hazards in the Nigerian telecommunication industry.
Safety first should always be the first word in every pep talk daily on telecommunication operations and training in the telecommunication industry till it becomes a part of everyone. In controlling safety issues by human factors, the telecommunication industry in Nigeria will reduce accidents caused by carelessness and other said factors thereby reducing costs from inefficiency or mistakes that could be costly to the telecommunication company in deaths or operational cost.

5. Recommendation and Conclusion

The telecommunication industry in Nigeria requires a higher level of safety training and constant monitoring to close gaps caused by safety issues resulting from human factors, so far so good the industry is improving daily on ways to close this gap and one of the ways this is being done is the use of safety systems and policies to combat this gap. Due to the kind of jobs done in the telecommunication industry operations in Nigeria such as climbing at high altitudes, mechanical, civil construction and electrical works that could easily lead to accidents, deaths or serious cases of risk and liability from safety issues that can be caused by human factors which could have been avoided. I would recommend that every telecommunication outfit in the Nigerian telecommunication industry must have a safety policy in place managed by an accredited and qualified health and safety department that will monitor, evaluate and ensure constantly that operational engineers on site, project administrators and officers etc. in the Nigerian telecommunication industry or outfit are always safety compliant. I would also recommend the use of quarterly trainings that should be made mandatory in any location of the country, this should also include a mandate that every field operation to be conducted must have a qualified health and safety officer to ensure the use of safety apparels/kits or equipment’s and use of checklists while job is ongoing or completed in the Nigerian telecommunication industry. If these recommendations are in place and functioning properly with co-operation from the telecommunication outfits in Nigerian industry. There should be a drastic stop to safety issues caused by human factors.

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