

Inspection of the Airport Maintenance Procedures and Operations of Juba International Airport in Juba, South Sudan

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Abstract - This study was set to establish the Inspection of the Airport maintenance procedures and operations of Juba International Airport in Juba, South Sudan. It was guided by the following specific objectives, that included determining the (i) To identify the regulator requirements for maintenance, (ii) to establish the parts and materials for airfield maintenance, procedures for maintenance and their implementation (iii) examine the maintenance equipment available and training of records and personnel maintenance (iv) To establish whether there is a relationship between Inspection of the Airport maintenance procedures and operations of Juba International Airport in Juba, South Sudan., The study adopted a descriptive survey design .it used questionnaires, face to face interviews. The target population was 220 from which a sample size of 145 was derived. Findings revealed that respondents between 25-35 year were 32.1%, female respondents dominated the study (64.3%); married were (53.6%) other marital status category; Bachelor holders dominated the study 50% and on occupation others dominated the entire sample size with 54.2%. Regards inspection of the Airport maintenance procedures the findings on Maintenance requirements revealed that, verifying that required facilities are provided (mean=3.29, std. .878) was rated highly, followed by identifying potentially unsafe conditions on the aerodrome for corrective action (mean=2.65 std. 1.064), ensuring that the aerodrome is properly maintained and that personnel who inspect and maintain the aerodrome are adequately trained (mean=2.12 std. 1.128), working with aerodrome and Civil Aviation Authority personnel to correct potentially confusing pilot visual aids that could cause pilots to become disoriented or lose their situational awareness (mean=2.09 std. 1.076), we check for pavement runway strips and runway end safety areas pilot visual aids – runway holding positions wind direction indicators – NAVAIDS – obstructions – construction area (mean=

2.02std. 1.105) with an average mean=2.43 std. .99116). Regards inspection of the Airport maintenance procedures the findings on Maintenance of pavements revealed that; pedestrian and ground vehicle operations was rated high with (mean=2.94 std. 1.023), aerodrome self-inspection program (mean=2.91 std. 1.067), followed by airport maintenance program and compliance to the aerodrome manual (mean=2.42 std. 1.117) followed by Wildlife Hazard management program and currency and accuracy of the aerodrome manual (mean=2.16 std. 1.210) then, aerodrome condition reporting – accuracy of aeronautical information (mean=2.09 std. .957) with an average mean of 2.50, std. 1.02221). Regards inspection of the airport maintenance procedures the findings on inspection security Dilemma revealed that; all taxiways and runways need to be inspected. runways are best inspected by driving along both sides of the runway, while a pass in each direction on all taxiways is a good practice to inspect signs from both directions was rated high (mean=2.88 std. .962), this was followed by , The initial aerodrome certification inspection is normally more in-depth and may involve multiple trips around the airport (mean=2.85 std. 1.028), then due to the width of a runway and the runway strip, a more effective inspection can be conducted by having the vehicle operator drive along both sides of the runway (mean=2.58 std. 1.172), The speed of the vehicle should be slow enough for the Inspector to conduct an effective inspection, taking into consideration how busy the aerodrome is (mean=2.53 std. 1.210), For safety reasons, Inspectors should have vehicle operators drive towards landing traffic along one side of the runway and backtrack on the parallel taxiway to conduct a second pass on the other side of the runway (mean= 2.38 std.1.255) with an average mean (mean= 2.64 std. 1.08997. Regarding Inspection it was recommended that; even passengers who normally receive expedited screening passengers, may at times receive a pat-down. A pat-down may include

inspection of the head, neck, arms, torso, legs, and feet. This includes head coverings and sensitive areas such as breasts, groin, and the buttocks. It is a requirement that the Runway and Taxiways are inspected at regular intervals to ensure that the surface complies with the criteria for use by aircraft. Regarding Airport Inspection operations in terms of Maintenance requirements the finding on Friction Testing reveal that, At each end of the runway, the runway end safety area should be inspected from the roads along approach lights, if present (mean=2.89 std. 1.105), followed by If there are no roads in the runway end safety area, it would not be a good idea to have a vehicle drive in the turf areas during wet conditions (mean=2.48 std. 1.077), then responses on during the inspection of the movement area, Inspectors should be on the lookout for improperly maintained, non-standard and potentially confusing marking, lighting or signs and work with airport staff to make corrections (mean= 2.35 std. .885), followed by Inspectors should photograph problems and document the problems on the appropriate checklist (mean=2.26 std. 1.107), At each runway end, check for the proper markings required for the authorized approach and verify the runway marking information in the National Aeronautical Information System. Also observe the condition of the markings (mean=2.07 std. 1.048). The Runway pavement is required to be in an acceptable state of repair, with access and egress unimpaired and to be free from FOD and wildlife. TSA incorporates unpredictable security measures, both seen and unseen, to accomplish our transportation security mission. Security measures begin long before you arrive at the airport. TSA works closely with the intelligence and law enforcement communities to share information. Additional security measures are in place from the time you get to the airport until you get to your destination. TSA adjusts processes and procedures to meet the evolving threat and to achieve the highest levels of transportation security. Because of this, you may notice changes in our procedures from time to time. TSA counts on the traveling public to report unattended bags or packages; individuals in possession of a threatening item; and persons trying to enter a restricted area or similar suspicious activities at airports, train stations, bus stops and ports. If You See Something, Say Something. Report suspicious activity to local law enforcement. Passenger screening at the airport is part of TSA's layered approach to security to get you safely to your destination. TSA's screening procedures are intended to prevent prohibited items and other threats to transportation security from entering the sterile area of the airport and are developed in response to information on threats to transportation security.

Keywords: Inspection, Airport maintenance, procedures and operations.

I. INTRODUCTION

This study was set to establish the Inspection of the Airport maintenance procedures and operations of Juba International Airport in Juba, South Sudan. It was confined to Maintenance requirements and raids, maintenance of pavements, inspection security dilemma, Friction Testing, state's political capacity, Electrical Systems and AG L Maintenance (Abdi, 2013).

Aerodrome Inspectors will need to inspect aerodrome maintenance operations to help determine if there is; adequate staff, and equipment, parts & materials. To properly maintain the aerodrome in accordance with national and international set standards and recommended practices.

Airport Maintenance is critical for ensuring serviceability of airport facilities and equipment as optimizing equipment efficiency (Kraft, Melanie 2019). Airport maintenance facilities may vary from very large complexes to a small shed at various size airport. Tools and spares are kept at these facilities. Smaller airports have limited resources and would naturally have much less maintenance equipment.

Establishing the Inspection of the Airport maintenance procedures and operations of Juba International Airport in Juba, South Sudan (Kraft, Melanie 2019).

Regulatory Requirements for Maintenance

The current Civil aviation Aerodrome Regulations (Regulation 286 – 292) require that the aerodrome operator establishes and implements a maintenance programme for all the aerodrome facilities and that the design of the programme should observe Human Factors principles. The Inspection team will therefore look at the implementation of the maintenance programme as outlined.

Maintenance requirements

Furthermore, the aerodrome operator should demonstrate the ability to; provide sufficient and qualified personnel to carry out the specialized maintenance activities. Equip personnel with sufficient resources needed to comply with the requirements for maintenance or the activities outlined in the maintenance programme (Kraft, Melanie 2019).

Maintenance of pavements

The Airport should have demonstrable capability to make pavement repairs or arrange for contractors when as necessary. Keeping pavement well sealed is critical for safety and

extended pavement life. When pavement breakup begins to generate FOD it is critical that immediate corrective actions to repair the pavement is carried out. Some airports stock material for sealing and making pavement repairs when necessary (Kraft, Melanie 2019). If pavement repairs are in progress during the verification inspection, the Aerodrome inspectors may take the time to observe the operation and check for adequate unserviceability markers to mark closed pavement areas (Kraft, Melanie 2019).

Friction Testing

Civil Aviation (Aerodrome) Regulations (Regulation 287) requires that measurements of the friction characteristics of a runway surface shall be made periodically with a continuous friction measuring device using self-wetting features.

The regulations also require that periodic friction measurements with Continuous Friction Measuring Equipment (CFME) are carried out by the aerodrome. It is expected that following the results of these tests the airport operator can demonstrate the ability to identify when to take appropriate corrective actions to maintain safe aircraft operations.

Pavement markings

Another area of maintenance for Aerodrome inspectors to evaluate is airfield markings painting capability. (Kraft, Melanie 2019) Some Larger airports normally have the airfield painted by airport staff. Small airports may not have painting equipment and must contract out the painting. The verification exercise may evaluate the arrangements outlined in the aerodrome manual, frequency of paint renewals etc.

Aerodrome inspectors may take a look at the specifications for the paint type used. While the use of traffic paint is acceptable it should be noted that it does fade faster and will need to be repainted more frequently (Kraft, Melanie 2019). At some airports, glass beads are used on taxiway, runway markings and holding position markings to make them more visible at night (Kraft, Melanie 2019). Conversely the capability to also effectively obliterate paint markings is advised as and when necessary.

Electrical Systems

The Airport maintenance personnel responsible for maintenance of electrical systems must be knowledgeable on safety procedures. The personnel should be aware of safety procedures and guidelines supporting electrical maintenance including handling of high voltage systems.

The Inspectors will also check the maintenance and testing procedures for the secondary power supplies including

UPS and standby generators. Logging mechanisms for faults will also be checked.

Appropriate Lock out tag out procedures implementation for de-energized systems should also be available at the aerodrome as a means of avoiding accidents during maintenance activities.

AG L Maintenance

It is required that a system of preventive maintenance for visual aids is employed to ensure both lighting and marking system reliability. It is also required that maintenance objectives for the airport lighting systems be established and implemented. The Inspectors will check for evidence that the maintenance activities outlined in the aerodrome manual are implemented.

In-pavement lighting systems may need specialized equipment and skills to repair in-pavement fixtures. The complexity of in-pavement light fixtures require airport maintenance staff to be knowledgeable and highly organized in order to use the correct fixture, correct color and install in the correct orientation when replacing in-pavement fixtures.

Non-paved areas in the strip

The Aerodrome Inspectors will check if there is a robust maintenance system for the non-paved areas of the strip (Kraft, Melanie 2019). Does the airport have enough mowers to mow the airfield in a timely manner? Is this service contracted out? What procedures are in place for managing the implementation of these contracted services.

During the inspection of the movement area, aerodrome certification inspectors also evaluate the following operations and data: pedestrian and ground vehicle operations, aerodrome self-inspection program, airport maintenance program, wildlife hazard management program compliance to the aerodrome manual, currency and accuracy of the aerodrome manual – aerodrome condition reporting and accuracy of aeronautical information.

II. MATERIALS AND METHODS

Location of the Study area

This study was confined to Inspection of the Airport maintenance procedures and operations of Juba International Airport in Juba, South Sudan, home to about 1.3 million people in 11 counties, is the largest and the most populous state in South Sudan, Juba is a multi-Inspection state inhabited by several Inspection groups, such as the Dinka, Nuer, and Murle (International Crisis Group 28). Juba International Airport (IATA: JUB, ICAO: HJJJ) is a multi-use international

airport serving Juba, the capital city of South Sudan. The airport is located 5 km (3.1 mi) northeast of the city's central business district, on the western banks of the White Nile. The city and airport are located in South Sudan's Central Equatoria State. It is one of the two international airports in South Sudan, the other being Malakal Airport. Juba Airport handles international and local airlines, cargo air traffic and chartered commercial flights. It is also used by the South Sudanese military and by the United Nations UNMISS, UN Humanitarian Air Services UNHAS, World Food Program WFP, ICRC and many NGOs for relief flights for the country.

Juba is also known as one of the least developed regions in the world, lacking basic infrastructure due to decades of civil war as well as marginalization by the central authority. Because Juba lacks functioning roads, most of the regions become inaccessible during the rainy season, which often hinders timely security response. The underdevelopment has also made poverty persistent in the region.

According to the National Bureau of Statistics, about 48 percent of the population in Juba is living below the poverty line (Omondi 2). The level of food insecurity has also been significantly high. According to FAO, since 2008, approximately 39 percent of the population faces food insecurity, and 30 percent faces severe food insecurity (7) (Harbom, 2004).

Sampling design

This study adopted a descriptive research design to identify the nature of the Inspection of the Airport maintenance procedures and operations of Juba International Airport in Juba, South Sudan at the time of collecting data.

Sketch Map of Showing the Location of Juba State in South Sudan (Study Area)



Sampling

Choices of respondents were based on three techniques: stratified sampling, purposive sampling and simple random sampling. Stratified sampling ensured that all categories of inspection of the Airport maintenance procedures and operations of Juba International Airport in Juba, South Sudan are represented; while simple random sampling gave each respondent a chance of representation and purposive sampling to select the respondents of the study.

Table 3.3.1: Sample size distribution

Category	Target population	Sample size
Engineers	50	30
Operational manager	50	40
Inspector of aviation	40	30
Forecster	30	20
Chief Operations Officer	50	20
Total	220	140

Source, Field consults (2023)

The study adopted a descriptive design since it describes the nature of Inspection of the Airport maintenance procedures and operations of Juba International Airport in Juba, South Sudan as it exists currently. The descriptive correlation design also used to establish the relationship between Inspection of the Airport maintenance procedures and operations of Juba International Airport in Juba, South Sudan.

The study population comprised of 140 respondents mostly the civil servants, community members, clan leaders, local council officials, employees from Juba State, South Sudan.

III. DATA ANALYSIS

All the information from the questionnaires was entered into Microsoft excel spreadsheets and Statistical Package for social Scientists. The SPSS and the Microsoft excel program was used to generate descriptive statistics, graphics, tables and charts. The interpretation of the descriptive statistics made it possible to formulate appropriate inferences in terms of determining the Inspection of the Airport maintenance procedures and operations of Juba International Airport in Juba, South Sudan. The qualitative data was analyzed into themes and concepts. Based on the grounded theory plausible relationships among themes and concepts were identified (Strauss & Carbin, 1998).

The data collection instruments were basically questionnaires, which comprised of open and close-ended questions that require respondents to answer all the questions to the best of their knowledge and options given to avoid

deviating from the variables under study supplemented with document Analysis of various organization sections/departments or branches and assess their classroom system (United Nations country Taskforce Monitoring and reporting Mechanism (UNCTFMR, 2023).

The questions were based on: profile of respondents which composed of, gender, age, tribe, occupation, health facilities, number of years in this province and Education. Additionally, regarding Inspection operations twenty five (35) items were set for instance on Maintenance requirements and raids (5 items), Maintenance of pavements five (5), Inspection security dilemma five (5), Friction Testing five (5), state’s political capacity five (5) question, Electrical Systems five (5), AG L Maintenance and (5). Additionally regarding level of Inspection thirty five (30) items, were set basing on following constructs public participation (5), Non-paved areas in the strip, five (5) questions, executive and rule of law five (5), Traditional & customary arrangement five (5), Transparency and accountability five (5) question five on Road maintenance (5), all these were guided by the response mode of; strongly agree (very high), agree (high), disagree (moderate) and strongly disagree (low).

Also the interview guide was used to bridge the gap between the circulated questionnaires among the respondents for instance; Civil servants, Community members/security officials, Clan leaders, local council officials, and employees in Juba State, South Sudan.

IV. RESULTS

This study was set to establish the relationship between Inspection of the Airport maintenance procedures and operations of Juba International Airport in Juba, South Sudan. It was guided by the following specific objectives, that included determining the (i) To identify the regulator requirements for maintenance, (ii) to establish the parts and materials for airfield maintenance, procedures for maintenance and their implementation (iii) examine the maintenance equipment available and training of records and personnel maintenance (iv) To establish whether there is a relationship between Inspection of the Airport maintenance procedures and operations of Juba International Airport in Juba, South Sudan.

Profile of the respondents

The findings indicated that majority of respondents were; majority of the respondents were between 25-35 year of age who composed of 32.1% . ; female respondents dominated the study with 64.3% out of the total sample size compared to their female counterpart; married respondents dominated the study with 53.6% sample size compared to other marital status category; Bachelor holders dominated the sample size with 50%; regarding occupation others dominated the entire sample size with 54.2%.

The Inspection of the Airport maintenance procedures and operations of Juba International Airport in Juba, South Sudan. The level of Inspection of the Airport maintenance procedures and operations of Juba International Airport in Juba, South Sudan, ranged from very high to low. Evidently, there were some areas of Inspection Operations in which the respondents were not fully satisfied such as; The findings on Inspection operations revealed that eight items were measured and rated as follows; Maintenance requirements and raids (Average mean=2.43, std .99116) Maintenance of pavements (Average mean=2.50, std 1.02221), Inspection security dilemma (Average mean=2.64, std. 1.08997) Friction Testing (Average mean=2.41 std. .99248), Pavement markings (Average mean=2.18 std. 1.03375) Electrical Systems (Average mean= 2.25 std. .85146) and AG L Maintenance (Average mean=2.49 std .63617) with an overall mean of 2.41).

With a surface area of 123,000 Sq Km, the largest and also the most densely populated of the 10 states in South Sudan, It suffers from a death of basic infrastructure such as roads, as well as chronic insecurity rooted in resource operations, and frequent floods. Crop production is the primary economic activity, although cattle and fishing play an important role in livelihoods. Sudan's second civil war began in Juba in 1983. The region is home to six Nilotic Inspection groups: the Nuer, Dinka, Anyuak, Murle, Kachipo and Jieh. Its lack of infrastructure has greatly limited the interest of external investors; French oil giant Total has been unable to explore its concessions there. Stability is a prerequisite for fulfilling the tourism potential offered by some of Africa's largest migrations of wildlife.

Table 4.2.1A: Inspection of the Airport maintenance procedures and operations of Juba International Airport in Juba, South Sudan (n=140)

Items on Inspection of the Airport maintenance procedures	Mean	Std	Interpretation	Rank
Maintenance requirements				
Verifying that required facilities are provided	3.29	.878	Very high	1
Identifying potentially unsafe conditions on the aerodrome for corrective action	2.65	1.064	High	2

Ensuring that the aerodrome is properly maintained and that personnel who inspect and maintain the aerodrome are adequately trained.	2.12	1.128	moderate	3
Working with aerodrome and Civil Aviation Authority personnel to correct potentially confusing pilot visual aids that could cause pilots to become disoriented or lose their situational awareness	2.09	1.076	moderate	4
We check for pavement – runway strips and runway end safety areas – pilot visual aids – runway holding positions – wind direction indicators – NAVAIDS – Obstructions – Construction Area	2.02	1.105	moderate	5
Average mean	2.43	.99116		
Maintenance of pavements			High	1
Pedestrian and Ground Vehicle Operations	2.94	1.023		
Aerodrome Self-Inspection Program	2.91	1.067	High	2
Airport Maintenance Program and compliance to the Aerodrome Manual	2.42	1.117	moderate	3
Wildlife Hazard management program and currency and accuracy of the aerodrome Manual	2.16	1.210	Moderate	4
Aerodrome Condition Reporting – Accuracy of Aeronautical Information	2.09	.957	Moderate	5
Average mean	2.50	1.02221	Moderate	
Inspection security Dilemma			High	1
All taxiways and runways need to be inspected. Runways are best inspected by driving along both sides of the runway, while a pass in each direction on all taxiways is a good practice to inspect signs from both directions.	2.88	.962		
The initial aerodrome certification inspection is normally more in-depth and may involve multiple trips around the airport.	2.85	1.028	High	2
Due to the width of a runway and the runway strip, a more effective inspection can be conducted by having the vehicle operator drive along both sides of the runway.	2.58	1.172	High	3
The speed of the vehicle should be slow enough for the Inspector to conduct an effective inspection, taking into consideration how busy the aerodrome is.	2.53	1.210	High	4
For safety reasons, Inspectors should have vehicle operators drive towards landing traffic along one side of the runway and backtrack on the parallel taxiway to conduct a second pass on the other side of the runway.	2.38	1.255	moderate	5
The speed of the vehicle should be slow enough for the Inspector to conduct an effective inspection, taking into consideration how busy the aerodrome is.	2.53	1.210	High	4
For safety reasons, Inspectors should have vehicle operators drive towards landing traffic along one side of the runway and backtrack on the parallel taxiway to conduct a second pass on the other side of the runway.	2.38	1.255	moderate	5
Average mean	2.64	1.08997		

Source: Primary Data (2023)

Regards inspection of the Airport maintenance procedures the findings on Maintenance requirements revealed that, verifying that required facilities are provided (mean=3.29, std. .878) was rated highly, followed by identifying potentially unsafe conditions on the aerodrome for corrective action (mean=2.65 std. 1.064), ensuring that the aerodrome is properly maintained and that personnel who inspect and maintain the aerodrome are adequately trained (mean=2.12 std. 1.128), working with aerodrome and Civil Aviation Authority personnel to correct potentially confusing pilot visual aids that could cause pilots to become disoriented or lose their situational awareness (mean=2.09 std. 1.076), we check for pavement runway strips and runway end safety areas pilot visual aids – runway holding positions wind direction indicators – NAVAIDS – obstructions – construction area (mean=2.02std. 1.105) with an average mean=2.43 std. .99116).

Regards inspection of the Airport maintenance procedures the findings on Maintenance of pavements revealed that; pedestrian and ground vehicle operations was rated high with (mean=2.94 std. 1.023), aerodrome self-inspection program (mean=2.91 std. 1.067), followed by airport maintenance program and compliance to the aerodrome manual (mean=2.42 std. 1.117) followed by Wildlife Hazard management program and currency and accuracy of the aerodrome manual (mean=2.16 std. 1.210) then, aerodrome condition reporting accuracy of aeronautical information (mean=2.09 std. .957) with an average mean of 2.50, std. 1.02221).

Regards inspection of the airport maintenance procedures the findings on inspection security Dilemma revealed that; all taxiways and runways need to be inspected. runways are best inspected by driving along both sides of the runway, while a pass in each direction on all taxiways is a good practice to inspect signs from both directions was rated high (mean=2.88 std.962), this was followed by , The initial aerodrome certification inspection is normally more in-depth and may involve multiple trips around the airport (mean=2.85 std. 1.028), then due to the width of a runway and the runway strip, a more effective inspection can be conducted by having the vehicle operator drive along both sides of the runway (mean=2.58 std. 1.172), The speed of the vehicle should be slow enough for the Inspector to conduct an effective inspection, taking into consideration how busy the aerodrome is (mean=2.53 std. 1.210), For safety reasons, Inspectors should have vehicle operators drive towards landing traffic along one side of the runway and backtrack on the parallel taxiway to conduct a second pass on the other side of the runway (mean= 2.38 std.1.255) with an average mean (mean= 2.64 std. 1.08997).

Table 4.2.1B: Airport Inspection operations in terms of Maintenance requirements, Maintenance of pavements, Inspection security dilemma, authority capacity, Electrical Systems and AG L Maintenance (n=140)

Friction Testing			High	1
At each end of the runway, the runway end safety area should be inspected from the roads along approach lights, if present.	2.89	1.105		
If there are no roads in the runway end safety area, it would not be a good idea to have a vehicle drive in the turf areas during wet conditions.	2.48	1.077	moderate	2
During the inspection of the movement area, Inspectors should be on the lookout for improperly maintained, non-standard and potentially confusing marking, lighting or signs and work with airport staff to make corrections.	2.35	.885	moderate	3
Inspectors should photograph problems and document the problems on the appropriate checklist	2.26	1.107	moderate	4
At each runway end, check for the proper markings required for the authorized approach and verify the runway marking information in the National Aeronautical Information System. Also observe the condition of the markings.	2.07	1.048	moderate	5
Average mean	2.41	.99248	Moderate	
Electrical Systems	2.86	1.066	High	1
Personnel Training and Qualifications				
The surface of pavements (runways, taxiways, aprons, etc.) should be kept clear of any loose stones or other objects that might cause damage to aircraft structures or engines, or impair the operation of aircraft systems.	2.68	.996	High	2
The surface of a runway should be maintained in a condition such as to preclude formation of harmful irregularities.	2.12	.935	Moderate	3
The surface of a paved runway shall be maintained in a condition so as to provide good friction characteristics and low rolling resistance.	2.02	1.011	Moderate	4
Measurements of the friction characteristics of a runway surface shall be made periodically with a continuous friction measuring device using self-wetting features	1.59	.806	Moderate	5
Average mean	2.25	.85146		

AG L Maintenance	2.82	.983	High	1
Pavement must be free of cracks and surface variations that could impair directional control of air carrier aircraft, including any pavement crack or surface deterioration that produces loose aggregate.				
Mud, dirt, sand, loose aggregate, debris, foreign objects, rubber deposits, and other contaminants shall be removed promptly and as completely as practicable.	2.77	1.095	High	2
Chemicals used to clean any pavement area shall be removed as soon as possible.	2.39	.984	Moderate	3
Loose aggregate can be ingested into jet engines and cause significant damage. This situation is also not in compliance with the FAA requirement to promptly repair cracks that produce loose aggregate	2.33	1.170	Moderate	4
Pavement shall be sufficiently drained to prevent ponding that obscures markings or impairs safe aircraft	2.14	1.033	Moderate	5
Average mean	2.49	.63617	Moderate	
Overall mean	2.41	.86233	Moderate	

Source: Primary Data (2023)

Regarding Airport Inspection operations in terms of Maintenance requirements the finding on Friction Testing reveal that, At each end of the runway, the runway end safety area should be inspected from the roads along approach lights, if present (mean=2.89 std. 1.105), followed by If there are no roads in the runway end safety area, it would not be a good idea to have a vehicle drive in the turf areas during wet conditions (mean=2.48 std. 1.077), then responses on during the inspection of the movement area, inspectors should be on the lookout for improperly maintained, non-standard and potentially confusing marking, lighting or signs and work with airport staff to make corrections (mean= 2.35 std. .885), followed by Inspectors should photograph problems and document the problems on the appropriate checklist (mean=2.26 std. 1.107), At each runway end, check for the proper markings required for the authorized approach and verify the runway marking information in the national aeronautical information system. Also observe the condition of the markings (mean=2.07 std. 1.048).

Regarding Airport Inspection operations in terms of Maintenance requirements the finding on Electrical Systems revealed that, Personnel Training and Qualifications was rated highest (mean=2.86 std. 1.066), The surface of pavements (runways, taxiways, aprons, etc.) should be kept clear of any loose stones or other objects that might cause damage to aircraft structures or engines, or impair the operation of aircraft systems (mean=2.68 std. .996), this was followed by The surface of a runway should be maintained in a condition such as to preclude formation of harmful irregularities (mean=2.12, std. .935), followed by The surface of a paved runway shall be maintained in a condition so as to provide good friction characteristics and low rolling resistance (mean=2.02 std. 1.011) . Measurements of the friction

characteristics of a runway surface shall be made periodically with a continuous friction measuring device using self-wetting features (mean=1.59 std.806) and with an average mean of (mean=2.25 std.85146).

Regarding Airport Inspection operations in terms of Maintenance requirements the finding on AG L Maintenance revealed that, Pavement must be free of cracks and surface variations that could impair directional control of air carrier aircraft, including any pavement crack or surface deterioration that produces loose aggregate (mean=2.82 std .983), Mud, dirt, sand, loose aggregate, debris, foreign objects, rubber deposits, and other contaminants shall be removed promptly and as completely as practicable (mean=2.77 std.1.095), followed by Chemicals used to clean any pavement area shall be removed as soon as possible (mean=2.39 std. .984), Loose aggregate can be ingested into jet engines and cause significant damage. This situation is also not in compliance with the FAA requirement to promptly repair cracks that produce loose aggregate (mean=2.33 std.1.170), then Pavement shall be sufficiently drained to prevent ponding that obscures markings or impairs safe aircraft (mean=2.14 std. 1.033) and with Average mean (mean=2.49 std. .63617) and an overall mean of (2.41 std.86233).

V. DISCUSSIONS

The operations has so far in Juba state that, on 19 December 2013, a nova airways Boeing 737-500 registration ST-NVG suffered nose-gear collapse resulting in major damage when landing at juba. This was the same day that many people were being evacuated from juba because of the south Sudanese civil war. The nova airways aircraft blocked the runway for several hours, delaying the evacuation. The aircraft was repaired and returned to service.

On 4 November 2015, an An-12BK EY-406 crashed on take-off, 800 metres from the runway. The fully laden Antonov-12 went low over buildings at end of the runway and crashed in a wet area next to the Nile river. There was no fire after the crash. At least 41 people were killed. Three survived the crash, though one later died, leaving a baby girl and a man the only survivors of this crash (Wani, Woja Emmanuel, 2018).

On 10 December 2019, Ethiopian Airlines Flight 357, a Bombardier Dash 8 Q400 registration ET-AQC excused from the runway during takeoff. The aircraft was substantially damaged. All 21 people on board survived. On 22 August 2020, an An-26 cargo plane belonging to South West Aviation crashed after taking off on a charter cargo flight to Aweil, South Sudan. 17 people were reported killed. On 2 November 2021, a cargo An-26 crashed soon after taking off, killing 5 people.

Hence, the establishment of patterns of regional Inspection is critical to the provision of an array of public goods such as peace and security, justice and rule of law, and natural resource and physical infrastructure development. Processes and strategies of constitutional choice in Liberia, for example, must conceive of regional scale of Inspection right from the start rather than perceiving such scale as relating to externalities that can be addressed later. What this means is that the role of regional institutions such as the East African Community on Economic Development must be seen as critical actors in processes of air transport choice undertaken to establish self-governing orders in the East African sub-region.

The study found out that the problem of the operations escalation and Maintenance had been resolved in some regions of Juba and the government had tried peace talks with the rebels whereas the government had disarmed some communities leaving other communities with guns hence causing panic and fear among the communities whose guns had been taken away, the government had failed to use local leaders of the notorious communities and the government failed to initiate development programs to engage the communities by transforming their ways of life.

Records; Records of maintenance activities including logs and maintenance reports should be kept. Airport maintenance personnel training records should also be kept and may need to be reviewed during the verification inspection.

Inspection reforms that depart from autocracy and monocentric Inspection must be based on a theory of Inspection that vests limited authority in several centers rather than centralizing power in a single center. Thus, polycentric

Inspection of local to regional scale is appropriate. In constituting such order in the Juba area, it is important that institutional reforms be made consistent with the nature of the Inspection challenges that confront the societies of the area. Certain reforms will have to be made on a regional scale and others at local, provincial or national scales. The nature of public goods and services to be delivered must determine the type and scale of institutional arrangements to be crafted. Institutional reform must provide both general purpose and task-specific Inspection institutions and such institutions must coexist, interact and overlap as necessary to ensure the efficient and equitable provision of such public goods and services (Frey and Eichenberger (1999).

Inspection of the Airport maintenance procedures and operations of Juba International Airport in Juba, South Sudan. There was a significant relationship between the Inspection of the Airport maintenance procedures and operations of Juba International Airport in Juba, South Sudan hence the null hypothesis was rejected. The relationship that exist between Inspection of the Airport maintenance procedures and operations of Juba International Airport in Juba, South Sudan is significantly correlated, (sig.>0.05). This means that Inspection operations influences good Inspection in Juba State, South Sudan and the failure to resolve Inspection operations well, the more poor Inspection, in relations to their posttraumatic condition, and other necessities as well as cease/failure to operate in the foreseeable future. Although a larger group might make a credible commitment not to abuse a smaller one by power-sharing, guaranteeing a diverse military, or letting the minority hold important economic assets hostage, a shift in one Inspection group's power (especially demographic) makes such commitments break down.

Maintenance of pavements provides an appropriate lens to explain the traditional aspect of Inspection operations in Juba. In South Sudan, cattle are crucial assets for all Inspection groups because cattle are 'a primary currency for these groups, representing wealth and social status, and are used for compensation and the payment of wedding dowries' (Rands and LeRiche 2011:7). Roughly 80 percent of the population depends on Maintenance requirements to survive, and the livestock industry has been one of the largest sources of employment (Ferrie 2012:5). Because cattle are directly related to the survival of these groups, people often enter territories of other Inspection groups and loot cattle. Not only are looted cattle used for sustaining people's lives, they are also sold in exchange for small arms (Rolandsen and Breidlid 2012:54). Although the primary targets in these clashes were cattle, use of such weapons as protection has increased the human lethality of operations.

VI. CONCLUSIONS

While the operations that rages there bears similarities to operations elsewhere in Africa, each operations warrants careful studies that uncover its special features and reveal clues as to how its challenges can be addressed.

It is recommended that in addition to specific maintenance courses, Maintenance Personnel are also trained on the following; Differentiation between movement and non-movement areas. Definition of a runway incursion. Rules & procedures for safe operations on movement & non-movement areas.

Airport layout. Airport markings, lighting & signage systems. Radio communications procedures with ATCT including lost communications, Procedures for reporting unsafe conditions, Procedures for aircraft mechanics who taxi on movement area, Construction procedures and safety, Consequences of non-compliance.

Identifying potentially unsafe conditions on the aerodrome for corrective action. Ensuring that the aerodrome is properly maintained and that personnel who inspect and maintain the aerodrome are adequately trained. Working with aerodrome and Civil Aviation Authority personnel to correct potentially confusing pilot visual aids that could cause pilots to become disoriented or lose their situational awareness.

Regarding Inspection operations, it was recommended that; Equitable sharing of resources, Strengthening local administration, Empowerment of traditional leadership, Government to treat all communities equally, Minister should visit all communities regularly, Creation of new counties and states as discussed, Location of state capital to central areas should be discussed, Provision of judges and public prosecutors; construction of courts in the counties, Upgrading of unqualified employees through capacity-building, compensation of salaries to employees. While issues of inclusive Inspection and equity are important drivers of operations, these statements highlight complex and in some cases long-standing Inspection-related issues which largely went beyond the mandate of the peace conference. Political accommodation provides people with an approach to tackle these Inspection issues directly.

Runways are best inspected by driving along both sides of the runway, while a pass in each direction on all taxiways is an excellent practice to inspect signs from both directions. The initial aerodrome certification inspection is normally more in-depth and may involve multiple trips around the airport. The goal of the inspection of the movement area is to ensure that the required facilities are provided and that the aerodrome is safe and properly maintained.

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