Surveying &

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Presentation Outline

- What is surveying?
- Importance of surveying
- Core disciplines of surveying
- Uses of Surveying
- What is Aviation?
- The relationship between surveying and Aviation
- Variations in Aviation in relation to Surveying.
- Conclusion
What is surveying?

Surveying is the scientific technique to determine the position of points and angles & distances between them. The process of surveying is used to fulfill various purposes. It is necessary for making maps, planning a project etc. To accomplish all civil engineering works or projects successfully, surveying is used.
Surveying and its importance

Surveying is important and most of us depend on it so as to ensure order in the physical world around us. Surveyors play an integral role in land development, from the planning and design of land subdivisions through to the final construction of roads, utilities and for landscaping and aviation purposes.
Land surveying involves measuring and mapping the world around us using mathematics, advanced software and equipment. Land Surveyors are experts in measuring and determining land size. They also provide advice and information to help designers, architects, developers and pilots in their work.
The core disciplines of surveying

- Land surveying (also known as Cadastral Surveying) ...
- Engineering surveying.
- Mining surveying.
- Hydrographic (Bathymetric) surveying.
- Geodetic surveying.
- Aerial (Photogrammetry and remote sensing)...
- Topographic (Detailed survey)

among others............
Uses of Surveying

- Topographical maps showing hills, rivers, towns, villages, forests etc. are prepared by surveying.
- For planning and estimating new engineering projects like water supply and irrigation schemes, mines, railroads, bridges, transmission lines, buildings etc. surveying is required.
- Cadastral maps showing the boundaries of fields houses and other properties are prepared by surveying.
- Engineering maps showing the position of engineering works like roads, railways, buildings, dams, canals etc. are prepared through surveying.
- To set out works and transfer details from map to ground knowledge of surveying is used.
- For planning navigation routes and harbors, marine and hydro-graphic surveying are used.
- To help military strategic planning, military maps are prepared by surveying.
- For exploring mineral wealth, mine surveys are necessary.
- To determine different strata in the earth crust, geological surveys are required.
- Archeological surveys are used to unearth relics of antiquity.
What is Aviation?

- Airlines
- Airports
- Aircraft Manufacturers
- Aircraft and Airport maintenance
- Regulation
- Air Traffic Control
- Safety, Security and the Environment
- Interest groups
- Government Policy
What is Aviation technically?

- Aviation is derived from the word AVIS (the latin word for BIRD)

- Aviation also refers to flying using an aircraft, like an aeroplane. It also includes the activities and industries related to flight, such as air traffic control, Aeronautical Information, Communication Navigation and Surveillance among others. The biggest of the many uses of civil air travel and military operations.
The relationship between Surveying and Aviation?

Surveyors play a vital role in the aviation industry in a number of ways:

❖ Design.
❖ Development.
❖ Production.
❖ Operation and use of Aircraft.
❖ Data acquisition and management.
Design involves Architectural and infrastructure-related requirements the way the terminal building is designed, the aprons, the runways and other movement areas (i.e. taxiways).

![Design Image]
DEVELOPMENT

This involves the development of infrastructure at the airport and among others development of Procedures all to be used by aircraft either on ground or in air traversing the Ugandan airspace and other stakeholders using the airport.
PRODUCTION

This involves the production of Aeronautical charts and maps which facilitate pilots, Air traffic controllers and all other stakeholders with the direction, location and exact position of a point or route.

This brings about the introduction of Cartography which is the study and practice of making maps, which maps depict what is written in so many words in a more defined picture and cartography which is also a branch of surveying solves this mystery.
OPERATION OF AIRCRAFT

Operation involves procedures, instructions and guidance for use by ground personnel and pilots operating aircraft. Operation means safe operation of the aircraft, precise and accurate measurements that result in precise location of facilities, Navigation Aids, masts, etc.
Data Acquisition and management

Data Acquisition

- Surveying is one of the most reliable and most times the only source of data used in aviation for both civil and military operations.

- Currently there’s need to acquire data for terrain and obstacle management as a requirement by the International Civil Aviation Organisation (ICAO) to make the skies safe for flying, which is a very vital aspect in aviation. In this Surveying is the primary means of collecting this data.
Data Management

Data acquired from the different surveying disciplines i.e. Cadastral surveys, Engineering Surveys, Aerial surveys, Lidar surveys and topographic surveys is used in a number of softwares to be able to produce Aeronautical charts and maps and these are:

- ArcGIS
- AutoCAD
- Global mapper
- Bentley Microstation
- Avitech Automated Aeronautical Information manangement System.
Variations in relation to aviation and surveying.

- In aviation the horizontal reference system is the World Geodetic System-1984 (WGS84). Reported aeronautical geographical coordinates (indicating latitude and longitude) shall be expressed in terms of the WGS-84 geodetic reference datum.

- In aviation the vertical reference system is measured according to the mean sea level (MSL) datum, which gives the relationship of gravity-related height (elevation) to a surface known as the geoid.
Conclusion

Surveying like any other discipline you know about is applicable and important in the operations, design, development, production, data acquisition and survival of the aviation industry because of:

• The need to know where to go, determine location.

• Graphical representation of data in form of Aeronautical charts and maps.

• Precise capture of ground data which can be used as a reference for many operations and help prevent collisions, accidents and incidents.
The surveying disciplines employed in Aviation are:

❖ Land surveying in opening boundaries for airports to confirm ownership and prevent people from encroaching on Airport land.

❖ Engineering surveying this is employed during the construction of runways, aprons, taxiways and terminal buildings whose structure is similar to roads and buildings.

❖ Aerial Surveying this is employed in a bid to assess and identify the terrain and obstacles that could be harmful to operation of aircraft within the country.

❖ Topographic surveying is employed to get a clear picture of the area around any airport to allow proper planning and efficient use of land available.
THANK YOU