

## 测绘产品质量管理

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**摘要:** 首先简要论述了测绘产品质量的重要性, 提出了测绘产品质量管理的要求, 然后结合工作中的实际情况, 详细阐述了加强测绘产品质量管理的一些方法与措施。

**关键词:** 测绘产品; 质量; 管理

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测绘事业是经济建设、国防建设、社会发展的基础性事业。因此, 测绘产品质量对保障国民经济建设和城市规划建设具有重要的地位。随着我国社会主义市场经济建设深入发展, 测绘行业也逐步由计划机制向市场机制转变, 由事业单位逐步改制为企业单位。由于测绘市场机制尚不完善, 导致一些测绘单位急功近利, 减少质量成本的投入, 尤其是测绘单位内部缺乏长期坚持科学管理等因素, 致使出现测绘质量明显的滑坡, 影响了测绘单位在市场上的信誉及形象。针对以上现实, 国家测绘局先后发布、实施了《测绘质量监督管理办法》和《测绘生产质量管理规定》2个法规性文件。我国加入WTO后, 绝大多数测绘单位都通过了ISO9000族标准贯标认证工作, 这些都标志着测绘产品质量已引起了足够的重视, 促进了测绘行业质量管理, 推动了测绘产品质量的提高。本人作为一名在测绘行业工作多年的国家注册质量工程师和测绘工程师, 深感确保测绘产品质量之重要性。因此, 本文就影响测绘产品质量的因素及如何加强测绘产品质量管理的一些方法, 结合自己多年的工作实践经验, 进行详细阐述。

### 1 测绘产品质量管理的要求

实施科学的测绘产品质量管理, 首先要树立适应形势要求的质量观念, 根据中央2个根本性转变的要求, 国家测绘局在全国测绘质量工作会议上提出以质量为核心, 市场、质量、效益结为一体的适应新形势的测绘质量观念。这对于指导测绘行业实现信息化、市场化, 走质量效益型的道路具有重大意义。

1) 以市场为导向。在市场经济条件下, 用户就是市场, 用户对测绘单位有选择的权利。测绘队伍必须强化市场观念, 增强服务意识, 满足用户需求, 才能在市场上立足。

2) 以质量为核心。测绘产品必须同时具备符合性、准确性、可靠性、经济性等质量特性, 在满足用户需求的同时, 也必须达到国家有关的测绘标准、技术规范的要求, 这些在《测绘》法中都有明文规定。

3) 以效益为前提。测绘队伍没有效益, 就无法生存, 这是不言而喻的道理。计划经济期间那种不计质量成本, 片面强调精益求精的观念要及时转变。

由市场、质量、效益构成了新的测绘产品质量管理观念, 三者相辅相成, 相互制约、相互影响。没有质量就没有信誉, 没有信誉就没有市场, 没有市场就没有效益, 没有效益就没有发展。测绘单位要牢固树立新的测绘质量观念, 以获取最佳的社会效益和经济效益为目标, 努力提高测绘产品质量, 促进测绘单位的持续发展。

### 2 提高测绘产品质量, 领导作用是关键

领导干部的质量意识对产品质量起着决定性作用。领导者的作用是质量管理活动的关键因素。领导者对本单位的管理观念、质量方针、质量目标、工作要求、员工作用和工作环境等制订、推动和实施起到关键作用。领导者应创造一个公平、公开、民主、开放与和谐的组织氛围, 充分发挥全体职工的主动性、创造性和积极性, 创造并保持职工充分参与实现质量目标的内部环境。测绘单位和主管部门的领导干部必须不断提高自身的质量意识、竞争意识和法制意识, 必须牢固树立质量与效益统一的观点, 把质量意识融化到每项管理工作中去。

### 3 建立质量管理体系, 规范测绘业务运作

从根本上建立起保障测绘产品质量的新机制, 提高测绘单位的市场竞争能力。树立新的测绘质量观念, 实施现代化的质量管理, 就要从过去传统的质量管理

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发展到现代的质量管理,与国际接轨,建立科学、规范的测绘质量管理体系。

1) 程序化。测绘生产作业是一个流程性作业,这就要求一个测绘单位的质量管理过程必须是一个程序化的管理过程。对测绘作业项目进行程序化管理,能够在每个环节及时发现问题,纠正错误,最终达到用户满意。

2) 标准化。标准化管理主要体现在统一化。在一个测绘单位里面,由于职工的学历、技能、素质等参差不齐,造成对测量的记录、整理、计算等五花八门。因此,很有必要制订各单位统一的测量标准,便于检查、归档,使测绘质量管理走上正轨。

3) 规范化。国家制订了许多测量规范,如《城市测量规范》、《测量图式》、《工程测量规范》等,各个测绘单位都必须在这些规范要求基础上,依据所属主管部门和所属城市特点,制定出适合本单位的测量技术规定。

#### 4 提高职工素质,全面保证质量

树立适应形势要求的测绘质量观念,建立完善的测绘质量管理体系,都要靠人来运作。从领导到职工,如果全员的素质不高,一切都是空话。每个人的工作质量直接关系到总体效果,所以很有必要对全体职工进行质量意识、职业道德、敬业精神的教育,激发他们的积极性和责任感。

测绘作业人员的职业道德和技能素质,是测绘产品质量优劣的决定因素。作业人员对待每一项测绘任务,都应全身心地投入,而不应该考虑条件的艰苦、难度的大小、仪器设备的落后等客观因素,应该以主人翁的态度、严谨的工作作风、科学的工作方法,全力以赴地完成各种工作,做到对用户负责,对产品质量负责。

测绘作业人员的技能素质对测绘产品质量也起着关键作用。同一批地形图,有的测量全面、准确、表达清楚,有的则符号表示不当,错绘、漏绘。这些现象都与作业人员的技能素质有直接关系。对此,必须加强对全体职工的专业培训和技术学习,尽快提高业务素质 and 技能水平,做到每位作业人员都是行家里手,都能独挡一面。

#### 5 发展运用高新技术,提高测绘产品质量

近几年来,以全球定位系统(GPS)、地理信息系统(GIS)、遥感技术(RS)和通讯网络(RTK)为代

表的现代化测绘技术体系取代传统的测绘技术体系取得了重大进展,测绘事业的科技含量显著提高,给测绘领域带来了全新的技术手段和作业方法,从而使测绘产品的质量、精度、可靠性都比传统方法有很大提高。

采用 GPS 全球卫星定位方法建立大地控制网,测角中误差可达零点几秒,最弱点点位中误差可达到毫米级,最弱边相对精度可达几十万分之一,而且速度快、效率高、数据可靠,充分保证了控制网的成果质量。采用全站仪配合电子平板进行数字化测图,比常规平板仪测图方法不仅提高了效率,更提高了成图精度,保证了地形图质量,并且为 GIS 提供了全要素的数据、图形、属性。

实践证明高新技术的引用和发展,极大地改变了传统测绘技术、手段和方法,极大地提高了测绘效率和精度,对测绘产品质量自然也有很大的提高和保证。

#### 6 重视过程管理,防范质量事故

测绘生产质量管理是指测绘单位从承接测绘任务、组织准备、技术设计、生产作业直至产品交付使用全过程实施的质量管理。测绘生产质量管理以质量为中心,满足需求为目标,防检结合为手段,全员参与为基础,促进测绘单位走质量效益型的发展道路。

1) 生产组织准备的质量管理。测绘任务的实施,应坚持先设计后生产,禁止没有设计就进行生产。技术设计书应按测绘主管部门的有关规定经过审核批准,方可付诸执行。市场测绘任务根据具体情况编制技术设计书。测绘任务实施前,应组织有关人员进行技术培训,学习技术设计书有关的技术标准、操作规程。在测绘任务实施前,还必须对所用仪器、设备、工具进行检验和校正,保证满足产品质量的要求,不合格的不准投入使用。

2) 生产作业过程的质量管理。测绘单位必须制定完整可行的工序管理流程表,加强工序管理的各项工作,有效控制影响产品质量的各种因素。生产作业中的工序产品必须达到规定的质量要求,以作业人员自查、互检,如实填写质量纪录,达到合格标准后,方可转入下道工序。

3) 产品使用过程的质量管理。测绘单位所交付的测绘产品,必须保证是合格品。测绘单位应当主动征求用户对测绘产品质量的意见,并为用户提供咨询服务。测绘单位应当及时、认真地处理用户的质量查询和反馈。与用户发生质量争议时,按照《测绘质量监督管理办法》的有关规定处理(见图 1)。

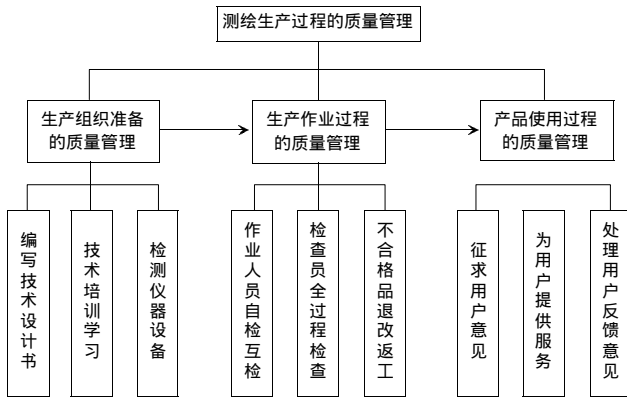


图1 测绘生产过程的质量管理流程图

### 7 加强质检力度，保证产品合格

质量检查分过程检查和最终检查两步，这两步检查的细致程度直接影响到测绘产品质量。质检员在检查中，发现并督促作业人员改正的问题越多，则越有利于提高测绘产品质量。

质量检查人员必须做到，思想作风端正、作业水平高、坚持原则、秉公办事，以国家颁发的《测绘生产质量管理规定》、《测绘产品检查验收规定》、《测绘质量监督管理办法》、各种规范、图式、技术设计书为依据，对测绘产品质量进行严格地、客观地、公正地检查验收。同时，质检人员也必须加强学习，特别要尽快掌握高新技术，提高理论水平和检查验收水平，以适应测绘生产技术发展的需要。

质量检查人员对产品质量负责，并有权对质量进行否决，不受各级领导的干预。测绘单位必须建立内部质量审核制度。测绘产品经过过程检查后，还必须通过质量检查机构的最终检查评定质量等级，编写最

终检查报告。

### 8 结 语

测绘产品质量保障在工业、农业、国防等工程建设乃至整个国民经济发展中占有极其重要的地位，国土资源部和国家测绘局非常重视测绘产品质量。近几年来，各测绘单位和测绘工作者的质量意识有显著增强，促进推动了测绘产品质量的提高。

社会主义市场经济体制已将测绘单位逐渐推向了市场，市场经济法则是公平竞争，优胜劣汰。因此，如果测绘单位不用质量、信誉去占领市场，不用科学管理来提高效益，就无法适应这种变化，必将被市场所淘汰。在社会主义市场经济体制下，测绘单位必须从战略高度上重视测绘产品质量管理。可以说，测绘单位靠质量求生存。

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dards, analyzed its application prospect in desktop GIS. With ArcGIS Engine as a developing kit, a tile map layer was developed which can load tile map into desktop GIS. This paper also proposed a uniform configure strategy which can integrate multi-source tile map into desktop GIS. And finally a prototype was brought forward to prove the practicability of the method proposed in the paper.

Key words desktop GIS ,WebGIS ,tile map ,map service ( Page:149)

#### Analysis of Settlement Observation Network for Bridge

by HUANG Dahu

Abstract This paper combining with the theory of settlement observation many years of practical experience introduced bridge settlement observation involved in some basic principle, including bridges monitoring benchmarks, work basis points and deformation observation introduction, monitoring network layout principle, general net form sample introduction, uneven subsidence caused by bridge the cause and monitoring network position arrangement, etc.

Key words bridges ,control network , differential settlement ( Page:152)

#### Comparison of the Two Algorithms in the Pier Subsidence Trends of High Speed Railway

by XIONG Si

Abstract In this paper, combined with the measured observation data of a bid section of one work area of Beijing-Shanghai high speed railway, the author analyzed the experimental data of Asaoka algorithm and gray GM (1, 1) algorithm, and calculated the theory fitted elevation and compared it with the measured elevation. By analyzing the elevation residual errors of corresponding model comparatively, the paper indicated that the fitting results of selected gray system GM (1, 1) algorithm are better.

Key words Asaoka algorithm ,the gray system GM (1, 1) algorithm ,high speed railway ,deformation monitoring ( Page:154)

#### Exploring of the New Mechanism of Annual Land Use Change Survey

by LI Jian

Abstract This paper introduced the history of Annual Land Use Change Survey in WuHan city. Through the comparison, new old mechanism problems existing in the new mechanism of Annual Land Use Change Survey an exploratory study.

Key words Annual Land Use Change Survey ,new mechanism ,exploration ( Page:156)

#### Teaching Practice and Course Construction of Geovisualization in GIS Specialty

by YAN Zhigang

Abstract We established Geovisualization course more early in GIS specialty. According to the course characteristics and the demands of the modern society for talents training, made a discussion on the necessity of course establishment, the course contents, the construction of teaching materials, teaching reformation, course practice, which provided valuable experiences for the course teaching.

Key words geovisualization ,course construction ,teaching reformation ( Page:159)

#### Discussion on Teaching Method for Principle and Application of Remote Sensing

by LU Xiaofeng

Abstract In this paper, the theory and experiment teaching method of "Principle and Application of Remote Sensing" was explored on the basis of teaching experiences. Teaching method about the basic theory was discussed as follows: the teaching content, teaching emphasis and teaching depth should be different in different profession; the knowledge points should be constantly updated; the active and interactive studying atmosphere should be created. The experimental teaching method was discussed as follows: teachers should demonstrate the usage of ERDAS or ENVI software to students while prelecting; experiments in class and centralized practice should be combined, validation experiments and comprehensive experiments and research design experiments should be combined. Using the above discussed teaching method would enable students to deeply understand and master the basic theoretical knowledge, and to improve the practical ability, the comprehensive ability of analyzing and solving

problems and the innovative ability.

Key words remote sensing ,surveying and mapping ,teaching method ( Page:162)

#### Surveying quality management of product by HUANG Jieyun

Abstract This paper briefly discussed the importance of the quality of mapping products, mapping products made of quality management requirements, and then combined with the actual situation of the work described in detail to enhance product quality control in a number of mapping methods and measures.

Key words Surveying product;Quality;Management ( Page:165)

#### Design of Experiment Teaching System of GIS Specialty on the Task-based Learning

by Dou Chang'e

Abstract The "task-based learning" teaching method is one of exploratory teaching modes. At the geographical information systems(GIS) professional experimental course, due to the course's own characteristics, the experimental teaching of operational and application ability training were pay so more attention by the students, that the teaching method seems suitable for them. After the analysis of the GIS professional on existing problems at present the experimental teaching, this paper introduced the "task-based learning" teaching ideas, the design of experimental teaching ideas of GIS based on "task-based learning" teaching method.

Key words task-based learning ,GIS ,experimental teaching ,teaching method ( Page:168)

#### Research on Influencing Factors of Surveying and Mapping Quality

by YANG Huishan

Abstract Quality of surveying and mapping is affected by many factors, and most of factors are difficult to quantify. Utilizing the Analytic Hierarchy Process to analyzes the weight of factors that affect the quality of surveying and mapping and sorting these factors according to the impact can determine the major factor.Study found that quality system was the primary factor impacting the quality of surveying and mapping. Production period, personnel training, process quality control and technical design were relatively important factors impacting the quality of surveying and mapping. And this paper suggested produce unit of surveying and mapping establish effective internal quality assurance mechanisms.

Key words quality of surveying and mapping ,influencing factors ,The Analytic Hierarchy Process ( Page:170)

#### Education of Surveying and Mapping in Hubei during Xinhai Revoluion

by LIAO Xiaoyun

Abstract Through reviewing the historical conditions of the surveying and mapping education in Hubei before and after the Xinhai Revolution, this paper explored the historical background of surveying and mapping team's development in Hubei during the process of implementing Hubei New Deal by Zhang Zhidong, reviewed the influence on surveying and mapping in Hubei by the mapping family Zou, fully understood the indelible historical role that Hubei surveying and mapping education did in cultivating talents for the Xinhai Revolution.

Key words running new schools, the mapping family Zou, surveying and mapping education. ( Page:173)

#### Surveying and Mapping People in Hubei during Xinhai Revlution

by WU Pengfei

Abstract This paper reviewed the past of the insurrectionary army in Xinhai Revolution, introduced the situation of students in Hubei Army Surveying and Mapping School and the historical event that they participated in the military relief maps measuring system. We also analyzed the historical reasons that during the Xinhai Revolution the Hubei surveying and mapping people played an important role, in order to make society fully realize the vital part that Hubei surveying and mapping predecessors had played in the success of the Xinhai Revolution.

Key words surveying and mapping people in Hubei, the platform of Chuwang, surveying and mapping military map ( Page:175)