Sailplane and Powered Sailplane maintenance in Europe

How it’s done

European Gliding Union

January 2005

Situation in Norway

Roles:
Pilot/owner: May do limited maintenance on own glider, below 100 hours / annual.
Club member: May do limited maintenance on club gliders, below 100 hours / annual, if approved by club Technical Manager.
Club Technical Manager: Primarily administrative function; Manages the maintenance of club gliders, responsible that gliders are maintained i.a.w. regulations and by certified personnel. Has responsibility vs. CAA.

Licensed personnel:
Seilflytekniker (Sailplane Technician): License issued by CAA. Permitted to to minor inspections (incl. 100 hours /annual) and repairs. May be permitted to do special tasks (instrument calibration check, compass check, weighing, engine maintenance) as add-on to license
Byggeleder (Ancient title ≈ "Bauleiter" ≈ "Sailplane building leader"): License issued by CAA. Permitted to to minor inspections (incl. 100 hours /annual) and repairs. May be permitted to do special tasks (instrument calibration check, compass check, weighing, engine maintenance) as add-on to license. Also permitted to do major inspection and repairs, in licensed category (e.g. wood & fabric, metal or composite)

Organisation:
Norwegian Aero Club / Gliding Section does not have a permanently employed Chief Engineer (or similar). Maintenance or technical matters are normally handled by the section's Technical Committee (3 – 4 volunteers), which manages updates of the NAC Sailplane Maintenance Manual, technical seminars, standards and proficiency tests of sailplane maintenance personnel etc.

Sailplane Technicians are not formally tied to one club, but sailplane technicians who perform maintenance on club gliders, must be approved by the club technical manager, and this must be recorded in a club-specific page of the NAC Sailplane Maintenance Manual.

CAA issues registrations, Certificates of Airworthiness, Airworthiness Directives etc. for sailplanes.

Norway has no commercial glider repair shops.

Documentation / Continued Airworthiness:
After September 2004, CAA issues multiyear CoA. For the CoA to be valid for flight, the aircraft must also have a valid Maintenance Report (Airworthiness Review Certificate) from an annual inspection. This Maintenance Report has 1 year validity. The annual inspection may be performed (and the report signed) by a Sailplane Technician, a "Byggeleder", a Part 66 technician, or a licensed Maintenance Organisation. The original is kept with the sailplane documents, a copy is sent to the CAA, and one copy retained by the technician.
The CAA inspects gliders at the first issuing of a Norwegian CoA, and also at intervals later (usually in connection with annual inspection / CoA re-validation). The stated goal is to inspect gliders every 5th year, on an average.

Each glider is required to have a file of technical documentation, containing:
- Flight Manual and Maintenance Manual (or equivalent)
- Manuals for instruments and equipment.
- Component cards for instruments/equipment that are mandatory or have a limited service life or maintenance interval.
- JAA/EASA Form 1 for instruments and equipment (where required/available).

- Copies of Maintenance Reports / Airworthiness Certificates.
- Detailed reports from inspections and repairs, except for simple tasks which are adequately recorded by only an entry in the log book.
- Weight and balance reports, with equipment list.
- Airworthiness Directives and mandatory Service Bulletins (or equivalent).

Overall rules for maintenance of light / non-commercial aircraft are laid down in the CAA's BSL (Rules for Civilian Aviation) B 2-3, which has specific paragraphs for maintenance of sailplanes.

The Norwegian Aero Club Sailplane Maintenance Manual contains specific instructions for maintenance and inspections of sailplanes and equipment, weighing and other special work, requirements for equcation and certification of sailplane technicians, documentation requirements, quality assurance etc.
It is managed and updated by the technical committe of the gliding section of the NAC. Changes need to be approved by the CAA.

Number of Gliders:
Airworthy gliders (ex. powered gliders) : Approx. 115
Airworthy powered gliders ("turbos", self-launched and TMG): Approx. 25

Cost:
CAA annual fee for Certificate of Airworthiness: ≈ 135 Euro
CAA fee for first issuing of glider CoA (for glider imported new): ≈ 310 Euro
CAA fee for first issuing of glider CoA (for glider imported used): ≈ 400 Euro
CAA fee for CoA if CoA/ARC has not been valid for > 90 days: ≈ 310 Euro
CAA fee for CoA if CoA/ARC has not been valid for > 2 years: ≈ 400 Euro

Maintenance liability insurance, mandatory for sailplanes insured in the fleet inurance scheme managed by the NAC: ≈ 25 Euro.

Sailplane technicians in most cases work for free or have expenses covered.

Quality Assurance / Auditing:
Technical reviews / audits by the CAA are normally performed in connection with CAA inspections of gliders or of gliding clubs (combined technical and operational).

NAC (gliding section) also performs reviews / audits of clubs, but NAC does not normally perform reviews / audits which are concerned with maintenance only.

Geir Raudsandmoen, 12.01. 2005

Situation in Sweden

In Sweden, the CAA delegates the maintenance of gliders and motorgliders to the Swedish Soaring Federation.

Roles:
Pilot/owner: May do limited maintenance on glider under supervision of glider technician.
Club member: May do limited maintenance on glider under supervision of glider technician.

Licensed personnel:
Segelflygtekniker (Glider technician): Training program for 3 weeks, then they receive a license issued by Soaring Federation with categories wood & fabric, metal and composite. Glider technician are permitted to do annual maintenance and minor repairs on gliders and motorgliders. They can also be permitted to do special tasks such as engine maintenance after an engine training program.
Glider technician also manages the maintenance of club gliders (private gliders), responsible that gliders are maintained according to regulations and by certified personnel.
There is also a possibility to dived the roles of Glider technician into a administrative function only (1 week training program) and to practical function (2 week training program) i.e. Glider technician engineer and Glider technician practical.

Organisation:
All gliders in Sweden even private owned are managed in the club structure if they use the Soaring federations technical organisation i.e. Glider technicians.
Swedish Soaring Federation has within the organisation a technical office, with a Chief Engineer (employed). Maintenance or technical matters are normally handled by this office. The Chief Engineer also supports the glider technicians in the clubs.

Glider technicians are tied to one club, every second year the club report to the federation witch technicians who will work in club; licences will then be re-issued by an inspection office with a Chief Inspector (Within the federation).

The Chief Inspector (employed) has a staff of airworthy inspectors (volunteer personnel) who are appointed by the federation and approved by the CAA. They do airworthiness inspections and revalidation C of A, in the name of CAA.

CAA issues registrations.

Documentation / Continued Airworthiness:
CoA issues for five year. For the CoA to be valid for flight, the aircraft must also have a valid Maintenance Report (compare with Airworthiness Review Certificate) from the annual maintenance of the glider. The annual maintenance are performed (and the report signed) by a glider technician, a Part 66 technician, or a licensed Maintenance Organisation. The original is kept with the gliders documents, a copy is sent to the inspections office (Soaring Federation – inspection office), and one copy retained by the technician.

The gliders are inspected by airworthy inspectors at the first issuing of a Swedish CoA, and also at intervals later. The stated goal is to inspect gliders every 5th year, on an average.

Each glider is required to have a file of technical documentation, containing:

- A reference page with information (Date and rev.) of Flight Manual, Maintenance Manual and Repair Manual (or equivalent)

- Weight and balance reports, with equipment list.
- Certificate of registration.
- CoA
- Manuals for instruments and equipment.
- Component cards for instruments/equipment which is mandatory or have a limited service life or maintenance interval.
- JAA/EASA Form 1 for instruments and equipment (where required/available).
- Maintenance and repair journal, with Maintenance reports / Airworthiness directives, mandatory service bulletins and documentations of all work on the glider.
- Copies of maintenance reports / Airworthiness directives.
- Detailed reports from inspections and repairs, except for simple tasks which are adequately recorded by only an entry in the log book.
- Flight report

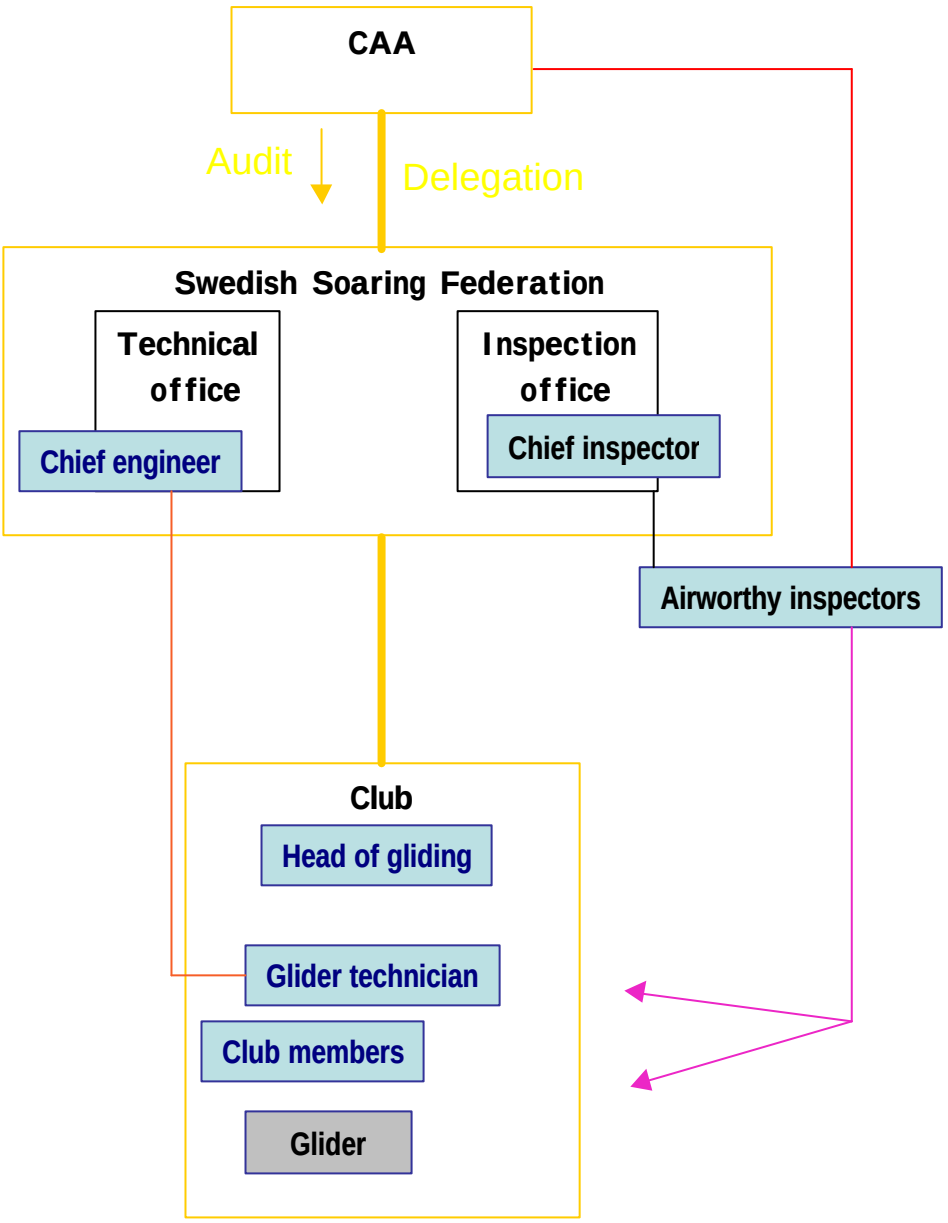
Overall rules for maintenance of gliders in Sweden can be find in CAA:s BCL (rules for civil aviation) and the Swedish Soaring Federations Glider Handbook (Segelflyghandboken). (EASA rules not mentioned here!)

Number of Gliders:
Airworthy gliders (incl. powered gliders SLG/SSG): Approx. 480
Airworthy motorgliders (TMG): Approx. 80

Cost:
CAA annual fee for Certificate of Airworthiness: ≈ 240 Euro
CAA fee for first issuing of glider CoA (for glider imported new): ≈ 280 Euro
CAA fee for first issuing of glider CoA (for glider imported used): ≈ 280 Euro

Glider technicians work for free or have expenses covered.

Quality Assurance / Auditing:
Technical reviews / audits by the CAA are normally performed at a central level in the Soaring Federation. Inspections of gliders and gliding clubs (combined technical and operational) are carried out every year (20 clubs) with airworthy inspectors and flight safety officers, which means that a club will have a visit normally every 4^{th} year in Sweden (75 clubs).



2005-01-24

Henrik Svensson

Chief Inspector
Swedish Soaring Federation

Situation in Belgium

TECHNICAL CONTROL FOR CoA GLIDERS (SAILPLANES + SELF-SUSTAINING SAILPLANES)

1. General

Since the start of gliding in Belgium all activities have been controled by the Royal Belgian Aero Club (RBAC). CAA is not involved – 'gentlemen's aggreement since 1954. The gliding related activities/administration is executed by the Belgian Gliding Federation (BGF) on behalf of the RBAC.
The federal structure of the country, required the BGF to splitt in 2 organisations: Liga van Vlaamse Zweefvliegclubs (covering the clubs in the northern part) and the Fédération des Clubs Francophones de Vol à Voile (covering the clubs in the southern part).
All rules/procedures are common but published in the appropriate language (Dutch/French).

2. Structure:

2.1. Bureau Techical Controle (BTC)
Office executing all administrative tasks
e.g. Issuing CoA, follow up inspectors, supporting training/examiniation inspectors, issuing/renewal inspectors licences, distribution AD's, TN's, ...

2.2. Chief Technical Inspector (CTI)
Overall responsable for the inspections, training/examination of inspectors + adviser

2.3. Co-ordinator for quality and standards
Responsable for audits maintaining the necessary levell of quality by the inspectors and maintenance done in the clubs.

2.4. Technical Inspectors (TI):
Every club has 1 or more inspectors (related to the number of gliders).
To become a TI the candidate must:

- be selected by the club, have a valid GPL, have a technical education or equivalent professional experience, have min. 3 years experience in the club maintenance work
- pass a theoretical exam, followed by a training periode doing inspections under supervision of a senior TI (min. 5), followed by a practical examination: complete inspection, W&B.

The TI licence is valid for 3 years. Renewal requires at least 3 inspections per year.
A TI is stricktly connected to his club (= also 'social control'), with approval of the CTI in advance he can inspect non-club related gliders
A TI may not inspect a glider if he has executed the maintenance (split in executing/controling)
A few TI are also apointed to check the engines of the SSS.

2.5. Administrative coördinator
Each club has responsable member for the follow up (mosty a TI), link with the BTC.

3. Regulation/procedures

The basic regualtion, all procedures and nessary forms are published by the RBAC in the "Organisation Manual for Technical Controle".

4. Maintenance:

Maintenance is done by the owner/pilot in club environment. Each club has/chaired a workshop and has a responsable member for the maintenance, mostly a senior TI.
There exists no maintenance licence. Professional experience and some training via

courses in foreign countries, and 'training on the job' under supervision of the "old foxes" gives an acceptable levell of knowledge/service/quality.
Every glider has his 'Course of Life' and maintenance record (=owner responsability).

Major repairs, most great overhauls are done by shops in DE/Poland/SLV.
"Common sense" is the ruler for what can be done by the club /owner or what must be outsourced.

5. CoA flow:

5.1. Owner sends a form to the BTC to get a "Controle Plan" (CPL), pays the fee, and makes an apointment with a TI of his club (most clubs make a winterschedule)

5.2. TI checks the related documents and inspects the glider – if the documents are OK and the glider is found airworthy, he signs the CPL

5.3. Owner sents the CPL to the BTC and

5.4. BTC sends within 48 Hrs the CoA to the owner.

5.4. CoA is valid for -12 months for club gliders and private owned wooden gliders
- 24 months for private owned fiberglass gliders

6. Some figures:

- +/- 550 gliders (incl. turbo's)
  (Self-launching + TMG = powered aircraft in BE!)
- 26 clubs
- +/- 55 TI
- CoA fee 12,00 €
  (Some overhead costs are paid by the membership fees)

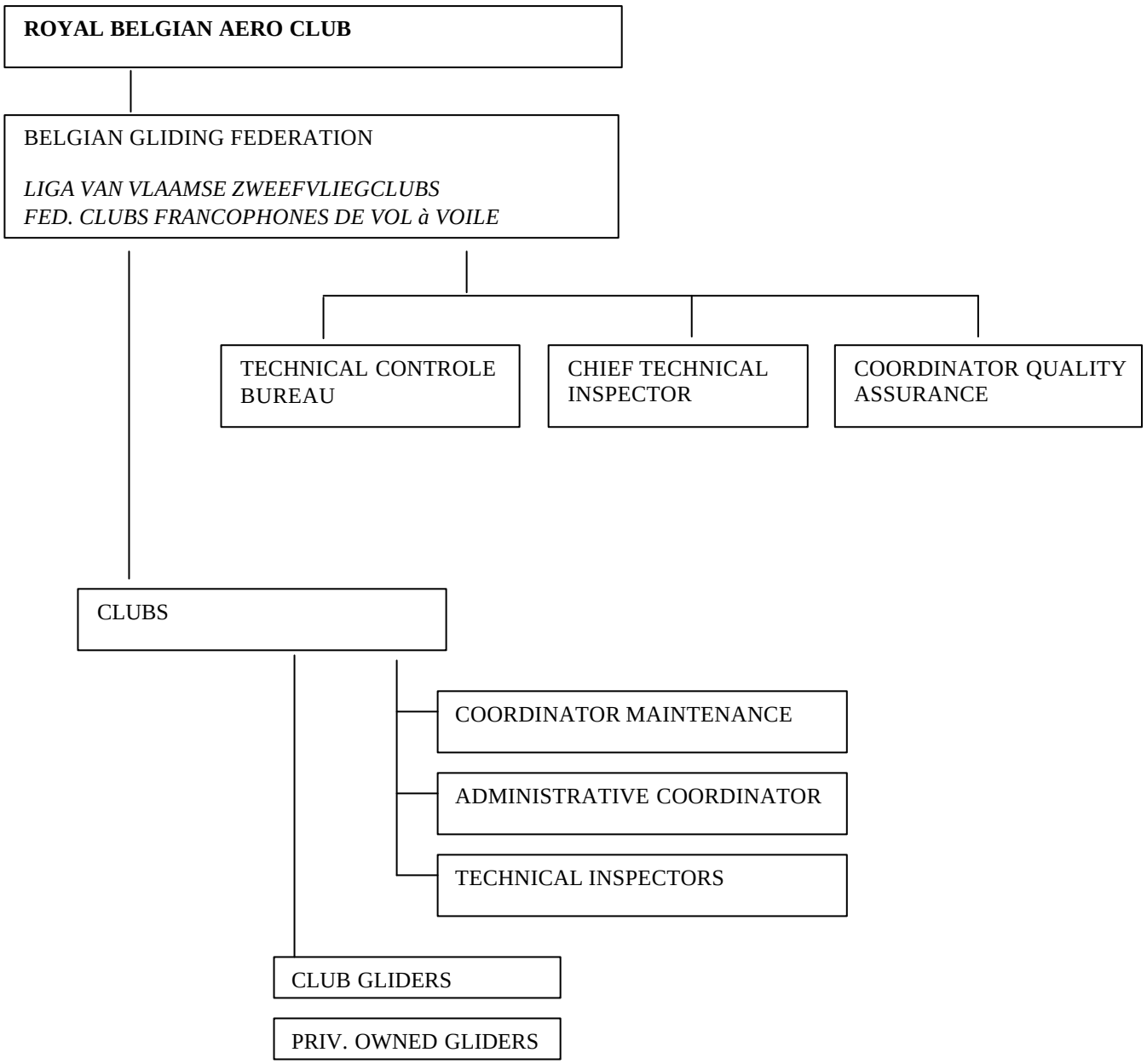
*** ALL WORK IS DONE BY VOLUNTEERS ***

Remark:

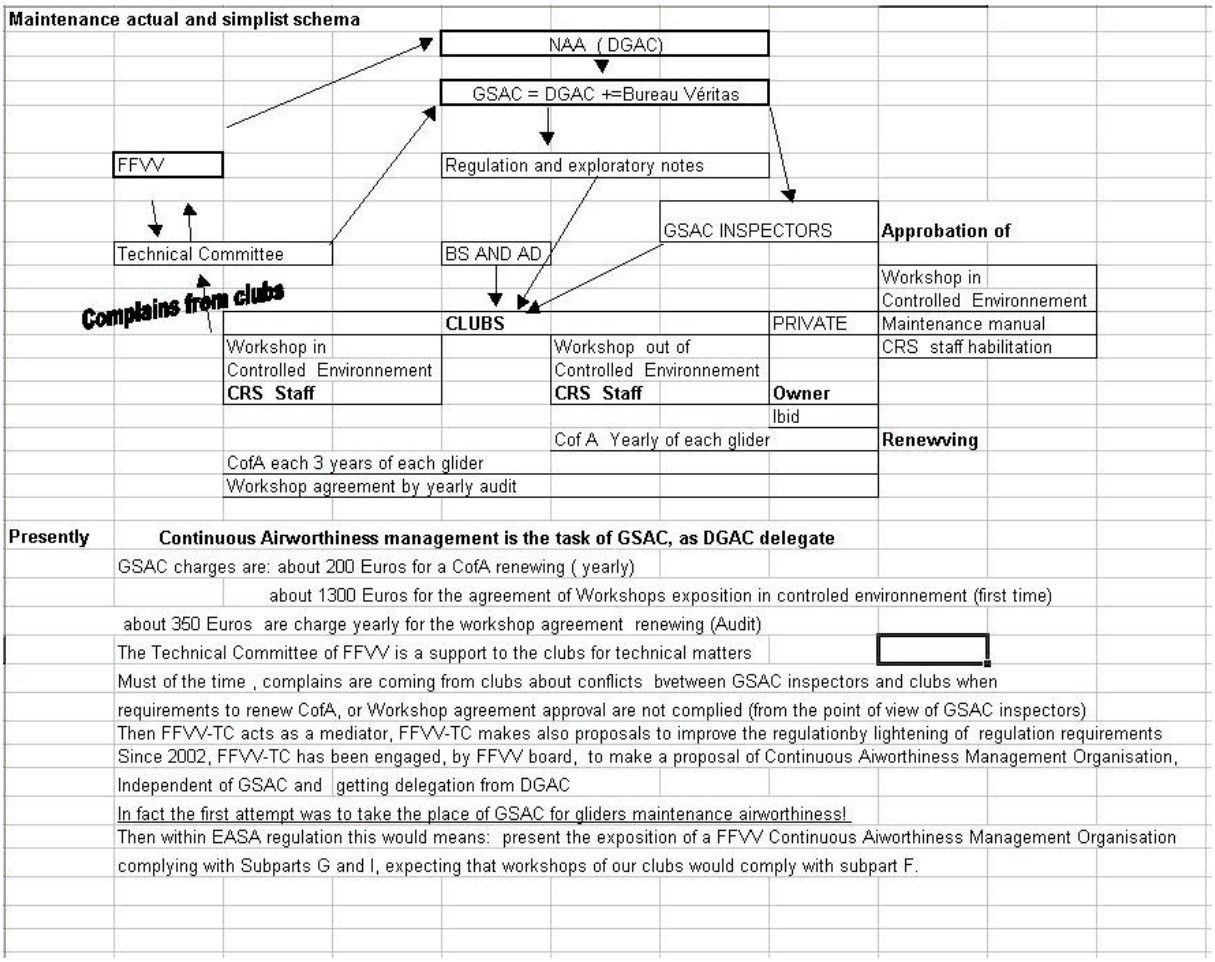
- There are no commercial operations/maintenance shops in BE.

"As few rules as possible, as much rules as necessary + common sense = basis of gliding"

TECHNICAL CONTROL FOR COA GLIDERS (SAILPLANES+SELF-SUSTAINING SAILPLANES)



Situation in France



Presently **Continuous Airworthiness management is the task of GSAC, as DGAC delegate**

GSAC charges are: about 200 Euros for a CofA renewing (yearly)

about 1300 Euros for the agreement of Workshops exposition in controled environnement (first time)

about 350 Euros are charge yearly for the workshop agreement renewing (Audit)

The Technical Committee of FFVV is a support to the clubs for technical matters

Must of the time , complains are coming from clubs about conflicts bvetween GSAC inspectors and clubs when requirements to renew CofA, or Workshop agreement approval are not complied (from the point of view of GSAC inspectors)

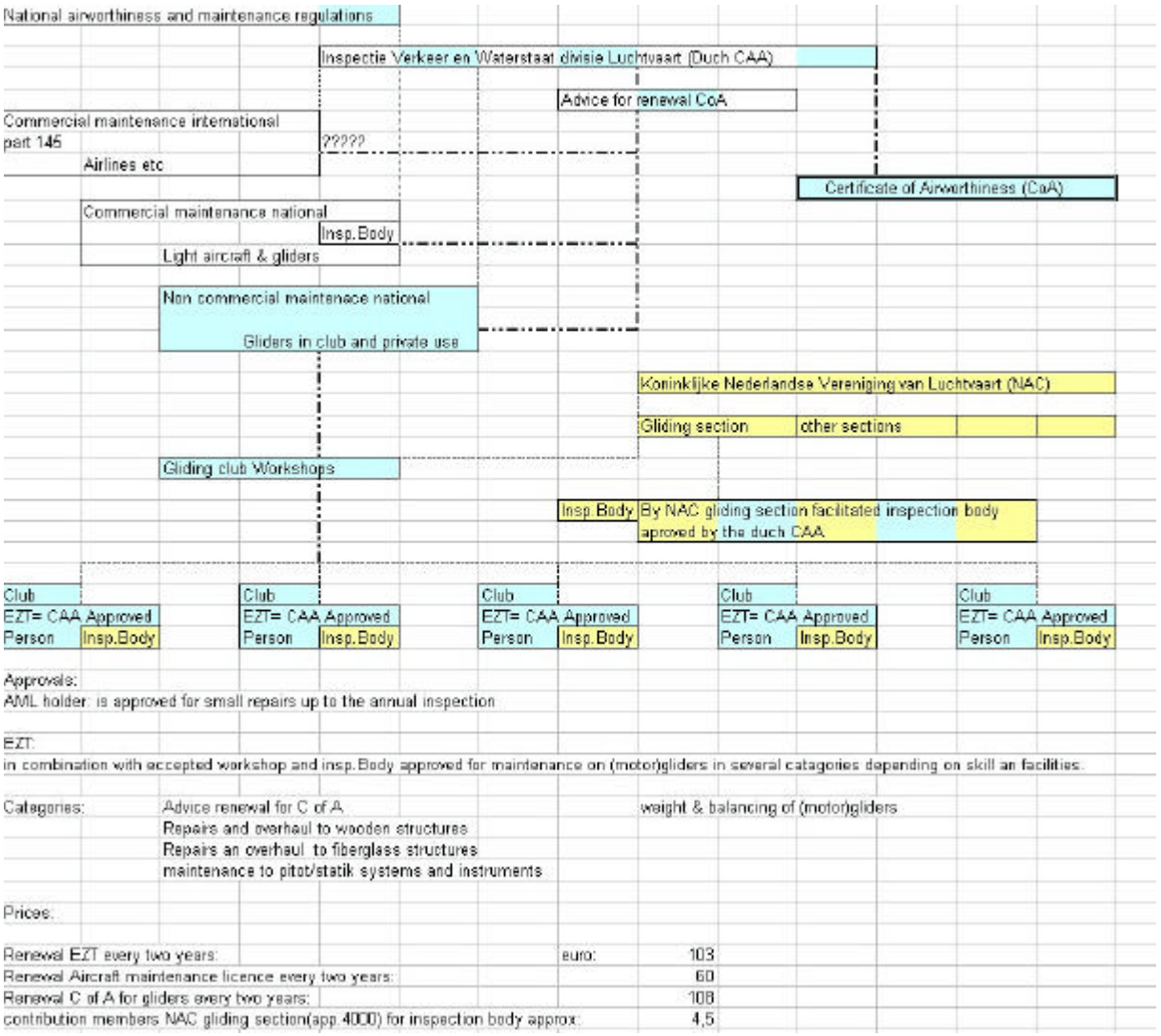
Then FFVV-TC acts as a mediator, FFVV-TC makes also proposals to improve the regulationby lightening of regulation requirements

Since 2002, FFVV-TC has been engaged, by FFVV board, to make a proposal of Continuous Aiworthiness Management Organisation, Independent of GSAC and getting delegation from DGAC

In fact the first attempt was to take the place of GSAC for gliders maintenance airworthiness!

Then within EASA regulation this would means: present the exposition of a FFVV Continuous Aiworthiness Management Organisation complying with Subparts G and I, expecting that workshops of our clubs would comply with subpart F.

Situation in the Netherlands



Situation in Germany

Staff:
Pilot/owner: May do limited maintenance on own gliders.
Sailplane Mechanic (= Pilot/Owner in Club environment): May do limited maintenance on club gliders owned by the club.
Sailplane Technician: May do minor and major repairs approved by official review staff
Club Technical Manager: Primarily administrative function; Manages the maintenance of club gliders, responsible that gliders are maintained i.a. to regulations and by certified personnel.

Licensed personnel:
Sailplane Mechanic: Trained, tested and licensed by German Aero Club. Permitted to do minor inspections (incl. 100 hours /annual) and repairs = Pilot/Owner maintenance
licensed category (wood & fabric, metal or composite, engines)
Sailplane Technician: Trained, tested and licensed by Germany Aero Club. Permitted to do minor inspections (incl. 100 hours /annual) and repairs. Trained to do minor and major repairs in an approved workshop and approved by official review staff. Full responsibility by review staff.
licensed category (wood & fabric, metal or composite, engines)

Official Airworthiness Review staff: Licensed by NAA. Permitted to perform maintenance, repairs and airworthiness reviews in an approved maintenance organisation environment. Those staff is allowed to run a one-man maintenance organisation with privileges compared to subpart F and G incl. 711 (b). They are trained Sailplanes Technicians with minimum three years experience and two weeks finial training incl. examination by NAA.

Organisation:
Due to the federal structure of Germany 12 maintenance organisations are operated by the state sections of the German Aero Club. These MOAs is approved by NAA have the privileges compared to subpart F and G incl. 711 (b). Some of these MOAs have permanently employed personal in the head office others a leaded by volunteers.
The local club maintenance workshops are part of the MOAs covered by one maintenance organisation manual. Official airworthiness review staff is working for the MOAs on a voluntary basis. The ratio between airworthiness review staff and locals clubs is about 1 to 5.

Each local club workshop organised by sailplane technicians. In general the workshops should hold the equipment and tools appropriate to the gliders they are maintaining but it is possible to share special tools within the MOA.

NAA issues registrations, Certificates of Airworthiness, Airworthiness Directives etc. for sailplanes.

Documentation / Continued Airworthiness:
For the CoA to be valid for flight, the aircraft must also have a valid maintenance report (Airworthiness Review Certificate) from an annual physical survey. This maintenance Report has 1 year validity. The annual physical survey and the signing of the report should be performed by official airworthiness review staff. The original of the inspection report is kept with the sailplane documents, a copy is sent to the MOA the review staff is working for, and one copy retained by the review staff.

Each glider is required to have a file of technical documentation, containing:

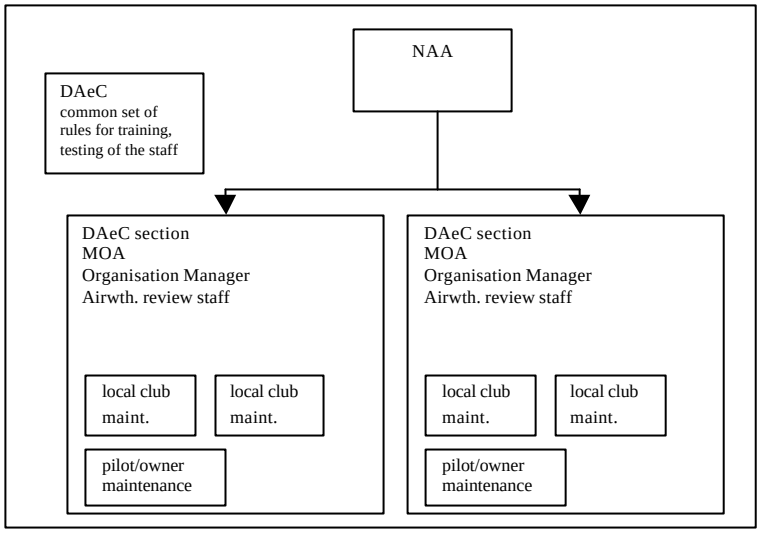
- Flight Manual and Maintenance Manual (or equivalent)
- Manuals for instruments and equipment.
- Component cards for instruments/equipment that are mandatory or have a limited service life or maintenance interval.
- JAA/EASA Form 1 for instruments and equipment (where required/available).
- Copies of Maintenance Reports / Airworthiness Certificates.
- Detailed reports from inspections and repairs, except for simple tasks which are adequately recorded by only an entry in the log book.
- Weight and balance reports, with equipment list.
- Airworthiness Directives and mandatory Service Bulletins (or equivalent).

Number of Gliders:
Airworthy gliders (incl.. powered gliders) : 7703
Airworthy powered gliders (“turbos”, self-launched and TMG): 2584

Costs:
Airworthiness review of a glider: 95 Euro
Airworthiness review of a powered glider: 150 Euro

Airworthiness review staff in most cases works for free or have expenses covered.

Quality Assurance / Auditing:
Audits of the maintenance organisations including local workshops are performed by NAA.



Situation in United Kingdom

In the UK, the CAA delegates the maintenance of motor gliders and tug aircraft to the BGA. Gliders are outside the scope of CAA involvement. All relevant processes are described in detail in the BGA Airworthiness Exposition.

Inspectors
Inspectors are appointed by the BGA following a successful selection process. They are subsequently re-appointed on an annual basis. The basic inspector rating scope can be widened by the addition of approvals (eg. engines, composite repair, etc) from the Chief Technical Officer. Inspectors can operate independently or within a club or professional repair facility. In all cases, they are responsible and liable for their activities. A glider may only be certified as fit for flight following maintenance (other than pilot-owner maintenance) by a BGA inspector who holds the appropriate approvals.

Club Technical Officers
Club technical Officers are appointed by club management to monitor technical activity within their club and are answerable to the club chairman. The inspectors operating within the club are expected to co-ordinate their activities with the club technical officer.

C of A Issue
UK gliders are registered with the BGA and the C of A must be revalidated annually. All gliders must have an annual inspection by a BGA inspector (including annual airworthiness review) and C of A revalidation is automatic on receipt and satisfactory checks of the inspection and review report at the BGA office.

Maintenance/Airworthiness Information
The BGA manages an information process to ensure that owners and inspectors are aware of maintenance related issues. The BGA Technical committee provides the expertise to ensure that gliders that do not meet type certification requirements are adequately catered for in terms of certification and continuing airworthiness.

Motor gliders and Tug Aircraft C of A Issue
Motor gliders and tug aircraft C of A's are reissued on a 3 year programme by the CAA. Approved BGA inspectors carry out an annual inspection (to a CAA schedule) within an M3 workshop. The C of A application follows an airworthiness review every 3 years by an approved M3 workshop 'manager' who is a BGA inspector.

Owner-Operators Responsibility
Owner operators are responsible for the continuing airworthiness and maintenance of their aircraft and should seek the assistance of an inspector where required. Owner operator maintenance limits are defined under CAA airworthiness notices. The owner operator is responsible for record keeping within the BGA approved aircraft logbook (or in the case of motor gliders or tug aircraft, the CAA approved logbook).

Quality
The BGA Chief Technical Officer periodically samples work carried out by BGA inspectors and also inspects gliders 'on the line'. The CAA periodically audits the M3 workshops. A process exists where the Chief Technical Officer will review any complaint/query relating to work carried out by a BGA inspector. The Exposition describes an inspector suspension process.

Pete Stratten
19th January 05

BGA Airworthiness Structure