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REPORT ON FIRE FIGHTING SERVICES IN THE FALKLAND ISLANDS

COVES MMENT SECRETARY

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FALKLAND ISLANDS

PART I. AND PART II.



Cheshire County Council



Fire Brigade Headquarters

Walmoor House Dee Banks Chester CH3 5UB Telephone Chester 22633 (STD CODE 0244)

A R Brannon FIHICE County Fire Officer

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If you telephone please ask for

Mr. Davis - Crewe 3246

Mis Excellency The Governor

29th April, 1977.

Your Excellency

Government House

FALKLAND ICLANDS

Further to my recent visit to the Falkland Islands I now have pleasure in submitting one copy of my report on fire fighting services.

The report includes within the Fire Prevention Section references and reports relating to premises other than Government and I should be pleased if this information could be made evailable to those parties concerned.

I would also like to express my sincere thanks to you, your staff and the people of the Islands for their friendly and willing co-operation thereby ensuring that my stay was both useful and enjoyable.

Yours faithfully

Maria

D. D. DAVIS M.J.FIRE E Assistant Divisional Officer Cheshire Fire Brigade

CONTENTS.

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| SECTION | 1. | INTRODUCTION, SUMMARY AND ACKNOWLEDGEMENTS. |
|---------|-----|---|
| SECTION | 2. | GENERAL DESCRIPTION. |
| SECTION | 3. | FIREFIGHTING REQUIREMENTS FOR STANLEY. |
| SECTION | 4. | ORGANISATION. |
| SECTION | 5. | APPLIANCE AND EQUIPMENT." |
| SECTION | б. | STANDARD TESTING OF EQUIPMENT. |
| SECTION | 7. | MOBILISING AND COMMUNICATIONS. |
| SECTION | 8. | TRAINING. |
| SECTION | 9. | HOSE. |
| SECTION | 10. | EXTINGUISHERS. |
| SECTION | 11. | AIRFIELD FIREFIGHTING. |
| SECTION | 12. | WATER SUPPLIES. |
| SECTION | 13. | FIRE PREVENTION - GENERAL. |
| SECTION | 14. | FIRE PREVENTION - INSPECTION REPORTS. |

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APPENDICES.

| 1 - | SCHEDULE OF APPLIANCE INVENTORIES. |
|------|---------------------------------------|
| 2 | ROUTINE TESTING OF EQUIFMENT |
| 3 | RESULTS OF STANDARD TESTS. |
| 4 | INCIDENT REPORT FORM. |
| 5 | SPECIAL SERVICE FORM. |
| 6 | TRAINING SUMMARY. |
| 7 | TRAINING SYLLABUS. |
| 8 | SUPPLIERS AND CRGANISATIONS. |
| 9 | EQUIPMENT COSTS. |
| 10 - | WATER SUPPLIES WITHIN STANLEY. |
| 11 | FIRE PREVENTION GENERAL RÉQUIREMENTS. |
| 12 | FIRE PREVENTION CODES. |

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1.1. INTRODUCTION.

1.1.1. Between 16th January 1977 and 26th March 1977 I was seconded as Fire Fighting Instructor to the British Government for the benefit of the Government of the Falkland Islands.

1.1.2. The terms of reference of the assignment were:-

To give training in modern fire fighting methods in Stanley.

To review the organisational side of the Fire Brigade and make recommendations.

To advise the Falkland Islands Government on fire precautions.

To advise on modern fire fighting techniques at the nearby airfield.

1.1.3. The areas detailed in the terms of reference have been fully investigated and where required implemented.

1.1.4. The British Representative in the Falkland Islands also requested that further areas be investigated and advice given and this is reflected within this report.

1.1.5. Whilst in Stanley time was also devoted to improving existing equipment for the benefit of Stanley Fire Brigade and equipment was also supplied, at very short notice, by Cheshire Fire Brigade.

1.2. BRIEF SUMMAY.

1.2.1. Stanley Fire Brigade requires re-organisation and additional expenditure if it is to provide a satisfactory fire service for the community.

1.2.2. The requirements of airfield firefighting and rescue services and Stanley should be combined.

1.2.3. There is a need for further training of selected individuals.

1.2.4. Considerable improvement is necessary in the field of fire prevention if the risk of life and property is to be reduced to an acceptable level.

1.2.5. Full use should be made of the expertise and advice freely available within the United Kingdom from Government and related Organisations before major expenditure on projects or equipment are undertaken.

1.3. ACHIONIEDGENERS,

I wish to acknowledge the following individuals for their encouragement and assistance:

FALKLAND ISLANDS.

His Excellency The Governor Chief Secretary Deputy Chief Secretary Superintendant of Public Works Superintendant of Fire Brigade Airport Superintendant Senior Education Officer Senior Medical Officer Acting Senior Medical Officer Falkland Islands Company Argentinian Representative Airfield Resident Engineer Cable & Wireless Limited Royal Naval Detachment Crown Agents Department J W Parker OBE Mr A Monk Mr D R Morrison Mr T Royans MBE Mr R Stewart Mr B Kanagasabi Mr F O'Riley Dr D Cox Dr: K Dunnett Mr T Spruce Senor Carnelli Mr T Spruce Senor Carnelli Mr I Stewart Sgt. Warrington Mr A Smith

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UNITED KINGDOM.

HM Chief Inspector of Fire Services County Fire Officer, Cheshire Fire Brigade Clerical Services

K L Holland CBE QFSM FIFireE Mr A R Brannon FIFireE Mrs G Downing

SECTION 2.

2.1. THE FALKLAND ISLANDS - GENERAL DESCRIPTION.

- 2.1.1. The Falkland Islands lie 300 miles east of Argentina and slightly north of the entrance to the Straits of Magellan at latitudes S51 and 53 and between longitudes W57 and 62. Two main islands form the greater part of the 4,618 square mile land surface; East Falkland 2,038 square miles with adjacent islands and West Falkland 2,038 square miles with its islands. These two islands are separated by the Falkland Island Sound. The islands rise to a height of 2,315 feet in West Falkland at Mount Adam and 2,245 feet on East Falkland at Mount Usborne.
- 2.1.2. The population is about 2,000 of whom about half live in Stanley the island's Capital.
- 2.1.3. The normal range of temperature is from 20°F to 70°F. The mean wind speed is 15 mph with an average rainfall of about 28 inches. Whilst the latitude south is the same as London is latitude north, mean temperatures are lower and the weather far more changeable due to the islands lying on the northern edge of the Cape Horn depression belt. Westerly winds blow for the greater part of the year and are usually strong.
- 2.1.4. There are few trees on the islands and large areas of grassland cover soft peat ground. The grassland is interspersed with rock outcrops forming a very attractive landscape similar to the moorland areas of Britain. The soft ground makes communication between settlements extremely difficult during the winter and wet months.

2.2. STANLEY.

- 2.2.1. Stanley is situated on the southern shore of a protected harbour on East Falkland. The harbour, Port Stanley, has open access to the South Atlantic via a narrow opening and a deep water estuary at Port William. Vessels using the Port Stanley harbour tend to be of below 5,000 tons, larger vessels anchor in Port William and use small craft to carry their passengers to the jettics at Stanley.
- 2.2.2. The town is positioned on a hill overlooking Port Stanley which rises sharply from the harbour road, known as Ross Road, to Davis Street, which is about 105 feet above sea level. The majority of premises are constructed of either wood or steel sheeting or a combination of the two. There are a few stone or brick buildings. Roofing material is almost exclusively steel sheeting and similarly internal cladding and partitioning is hardboard, plywood or compressed board material.

- 2.2.3. Roads within Stanley are mainly concrete and outside the town the only surfaced road was to the new airport. Travel from Stanley overland is extremely difficult; only tracks exist over the soft peat ground. Landrovers are the most common road vehicle. Because of this problem of transportation a Government operated air service is provided consisting of two De Havalland Beaver float planes. At the present time due to a pilot shortage only one aircraft is in regular service from the float plane base approximately one mile west of Stanley on Port Stanley harbour.
- 2.2.4. The Government also have a 144 tons vessel M.V.Forest which is at present contracted to HM Royal Marines and involved in various surveying and training activities.
- 2.2.5. The Falkland Island Company similarly have a vessel on charter, the M.V.Monsunen of 315 DwT. This vessel operates mainly around the islands transferring goods and general shipments to the settlements and transporting wool back to Stanley. After the Government the Falkland Island Company is the largest and most influential organisation in the Islands.
- 2.2.6. The F.I.Government which is based in Stanley consists of the Governor, an Executive Council and a Legislative Council. The Legislative Council consists of the Governor, two ez-officio members, the Chief Secretary and the Financial Secretary, four Elected Members and two Nominated Independent Members.
- 2.2.7. There is a Supreme Court with a Chief Secretary acting in the capacity of Judge. The Appeal Court sits in London. There is a small Administration Department and a Public Works Department.

2.3. BRIEF HISTORY.

The Islands were visited in 1592 by the English Navigator Captain John Davis. They were named in 1690 by a Captain Strong who landed on the Islands. France settled a small colony at Port Louis, on East Falkland, in 1764 but two years later ceeded its rights to Spain. England established a post in 1767 on the West Falkland which Spain closed but later reopened after threat of war. The post was abandoned in 1774. There was no formal occupation of the Islands then until 1820 when the 'United Provinces of South America' re-established Fort Louis. This colony was broken up by the Americans after an incident of alleged wrongful imprisonment of some American sealers. In 1832 Eritain re-asserted its claim to the Islands and the Argentine garrison were expelled. Since that date Britain has maintained its occupation.

2.4. TRADE.

2.4.1. Virtually the whole of the Islands are involved in sheep farming and there are over 600,000 sheep yielding about 4.5 million pounds of wool annually. The wool is sold on the London markets and this export produces over one million pounds storling. Hides and skins are also exported.

2.4.2. The Falkland Islands Company farms almost one third of the area and owns two thirds of the sheep. The majority of other farms are Company owned and controlled by resident managers. The FIC act in the capacity of agents and general merchants.

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2.4.3. Currency is the Falkland Island Pound which is equivalent to the pound sterling and British coins are used.

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FIRE FIGHTING REQUIREMENTS FOR SPINLEY AND ENVIRONS.

3.1. GENERAL DESCRIPTION.

3.1.1. Stanley is a small community, but in terms of importance to the islands it is, without question, of extreme consequence and therefore unlike small communities in the United Kingdom. It is isolated in terms of receiving assistance in the normal manner for fire fighting at serious incidents and this requires a certain degree of additional equipment to try and cater for a variety of situations. Fortunately the manpower requirement for fire fighting is available.

3.1.2. The general level of risk among buildings is high due mainly to their construction and relative locations to each other. The risk is further complicated by fairly constant high winds and a poor domestic water supply.

3.1.3. There are few premises of a large size but this is not to say that difficult fire situations cannot occur. The general standard of fire fighting seen was one of containment rather than attacking the seat of fire within a building. Breathing apparatus was used only for inspection duties and rescue procedures are not practised.

3.2. STANLEY.

3.2.1. The majority of buildings are domestic dwellings of two floors or less, usually detached, and averaging 30 feet by 30 feet. Most dwellings have a number of outbuildings, usually timber, within close proximity to their dwelling.

3.2.2. Government Departments include the following:-

Public Works Site which is a range of single and two storey buildings.

The Secretariat, a two storey concrete block building.

- The Governor's residence, part two and single storey of various construction.
- Two Schools, one predominently concrete block whilst the other timber.

The King Edward Memorial Hospital, part two single storey and of timber and brick concrete block.

Commercial premises vary from small stores of 60 ft by 30 ft of two storeys to larger storage arrangements and offices such as the Falkland Island Companys East Jetty facilities and their West Store. There is a Yacimientos Petroliteros Fiscales storage site, an Admiralty Oil Store, a number of MFP butane gas compounds, a Government Electricity Generation Station and a small assortment of allied service trades premises. 3.2.3. There is no high risk process, other than the oil/ petrol storage arrangements carried on within Stanley, that would not be found elsewhere in a community of this size.

3.2.4. A response time of not more than 15 minutes for the first appliance and the second appliance within 20 minutes is the general standard of attendance and this is a slightly higher response than that given for some similar communities in the United Kingdom.

3.2.5. The Brigade is capable of tackling fires of up to three or four jets and this is sufficient to handle the domestic situations. The policy of trailer drawn equipment does, however, tend to restrict and delay operations.

3.2.6. The rescue and breathing apparatus needs are insufficient to cater for a serious hotel fire or severly smoke logged building.

3.2.7. The existing premises occupied by the Brigade are in poor condition and in five separate locations. The Brigade should have a central station which should contain the following basic facilities:-

Areas for the maintenance of vehicles and equipment.

Equipment Storage.

Vehicle Caraging.

Hose maintenance and drying.

Breathing Apparatus maintenance and charging of cylinders.

Pump Testing.

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Practical Training Ground.

Lecture Room which could be combined for rest and leisure facilities.

Administration accommodation and watchroom.

The present British Antartic Survey garage would be of adequate size and could be rapidly adapted for the functions described.

3.2.8. Other areas of operation considered necessary for the effectiveness of the Brigade, including manning, are given under specific headings in other sections of this report.

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3.3. THE ENVIRONS.

3.3.1. The requirement for attendance cutside Stanley is related mainly to the geographical neture of the terrain but in most instances an appliance would be capable of reaching the isolated premises with slightly longer attendance times to those for Stanley.

- 3.3.2. The equipment recommended for in the needs for Stanley would satisfy the general needs of the outlying areas.
- 3.3.3. The existing appliances are capable of reaching most of the premises but with a limited water carrying capacity. In some locations this is of little importance since adequate open water supplies are available but in others it is critical.
- 3.3.4. The use of trailer drawn equipment is limited in the outlying areas since terrain makes progress very difficult. This limitation should be considered in the future and portable and self propelled equipment given precedence although initial costs may be increased.

3.4. OTHER EMERGENCY PROVISIONS.

- 3.4.1. Whilst not generally considered fir e-fighting requirements the following areas are of consequence in a small community and may be termed emergency services and could be administered successfully by the Brigade.
 - (a) Special Services.
 - (b) Ambulance Service.

3.4.1.1. Special Service.

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- 3.4.1.1.1. This is an area in which the British Fire Service has made special provision. Special Services include road traffic accidents, major disasters, animal rescues, extracation of persons trapped by machinery etc and the services are considered emergencies and no payment is required in respect of the Brigades attendance since the primary object is to save lives and reduce suffering.
- 3.4.1.1.2. The equipment carried could be extended as required to suit local requirements and a short list of the type of equipment suitable would be as follows:-

Portable winch of the Tirfor type. Hydraulic rescue equipment suitable for the extracation of casualties.

Compressed air cutting saw and chisels powered from breathing apparatus cylinders. (This equipment works from breathing apparatus cylinders and would be useful for the airfield.)

Portable lighting equipment. (This equipment is available in Public works).

Handtools including saws, chisels, wrenches, metal snips, bolt cutters, hamners etc.

3.4.1.1.3. The equipment could be suitably a owed in easily handled frames or boxes which could normally be located at the Central Station and quickly placed on a vehicle when required.

3.4.1.2. Ambulance Service.

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3.4.1.2.1. At present the ambulance service consists of a Ford vehicle which is capable of carrying two stretcher cases. The vehicle cannot cross the difficult terrain and is usually manned and driven by the on duty Dector. Whilst this service is no longer part of the British Fire Service due to certain distinct problems there is a possibility that the Stanley Brigade could operate an emergency service ambulance. This would provide a very useful pervice to Stanley's community and would also be of advantage to the needs of the airfield.

5.4.1.2.2. The ambulance vehicle should, in order to be of maximum benefit, be capable of crossing the more difficult areas of the airfield with at least two stretcher cases and again the landrover type appears most suitable.

3.4.1.2.3. It is understood that the Senior Medical Officer has requested this type of vehicle as a replacement for the existing ambulance.

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ORGANISATION.

4.1. General Description.

4.1.1. The present Stanley Fire Brigade consists of a wholly volunteer force of fifty men and one permanently employed Handyman. The Superintendant of Fire Brigade is appointed by the Governor under the provision of the Fire Brigade Ordinanco.

4.1.2. The Brigade functions under the supervision of the Superintendant of Public Works who is directly responsible to the Chief Secretary and through his office to the Governor for all matters, including expenditure, concerning the Brigade.

4.1.3. The responsibilities of the Superintendant of Fire Brigade are defined as follows:-

Fire Brigade administration and procedures, the upkeep and maintenance of equipment, fire boxes, ladders etc. and for advice to Stamley town dwellers on fire prevention matters. He is also Government Fire Officer and responsible for the operation of the fire service at the airfield.

4.1.4. The geographical area of operation for the Brigade is that enclosed between the Marine Camp in the West and the airfield in the East and ships at anchor. Elsewhere the Brigade may operate at the discretion of the Superintendant of Fire Brigade following a request from the Police.

4.1.5. To assist in command of the Brigade there is an Assistant Superintendant and four Captains. Each member of this command structure including the Superintendant receives a small remuneration.

4.1.6. The existing organisation was found lacking in a number of areas and there was the groblem of effective command over volunteers. The Superintendant indicated that in attendance at incidents the response was about 90% but sometimes only 50%. In terms of manpower this does not present unsurnountable difficulties but it indicates that effective command is particularly difficult in that the organisation depends entirely upon the goodwill of individuals.

4.1.7. There is also a need to provide regular weekly fire cover for flying operations at the airfield and when the new airfield comes into service there will be a further need to maintain the facilities at the airfield. This is at present carried cut by members of the Public Works Department.

4.2. INTERPRETATION.

4.2.1. In considering the practical application of the

above it appears necessary to form a selected nucleus of trained wholctime mon who would be the basic fire fighting force and organisation of the Brigade. This nucleus would control the standard within the volunteer element and thereby greatly improve the system of control.

4.2.2. Because there could only be a small number of wholetime men there will always remain the necessity for additional manpower to cater for those major incidents which occur. It is, therefore, important to encourage a comradeship between all members of the Erigade and the continuation of a weekly training evening and the formation of a social atmosphere would probably be the best way of achieving this. The Erigade must have an identity which the men readily accept and wish to belong to.

4.3. PROPOSED ORGANISATION.

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4.3.1. The Brigade should become a separate unit of Government. The control, administration and organisation including financial budgeting should be the direct responsibility of the Superintendant of Fire Brigade. He should receive additional training in the United Kingdom both in fire fighting and basic Fire Prevention. His appointment should be suitably salaried and made on the recommendation of the Chief Secretary and Superintendant of Tublic Works. He must possess qualities of leadership and the abilities of administration and organisation. Whilst his prime duty must be the administration of the Brigade and Government Fire Officer it is appreciated that he may have to be prepared to act in other capacities, for example, the maintenance of the new airfield. However, these additional areas of responsibility must be defined and subserviant to the Brigade. The ultimate success of the Brigade will rest entirely with the individual chosen.

4.3.2. There should be a nucleus of wholetime firchen. Again the man chosen will, due to cost factors, have to be utilised to perform other functions and in this respect the Falkland Islands are perhaps unique in that there is little demarcation of labour. The men should be selected by an appointments board.

4.3.3. The vholetime firemen should provide fire cover for both the airfield and Stanley. Flying duties require a minimum of six men, including the Superintendant, and this should, therefore, be the minimum Fire Brigade Wholetime establishment. It would be preferable to employ eight wholetime men to cater for sickness and leave but conomic considerations may prevent this. Therefore, by prearrangement, Volunteers should be engaged when necessary to maintain minimum flying cover and the additional two wholetime men engaged when the economic situation permits.

4.3.4. Their poin duty would be fireden and a percentage of their time would be allocated to training and appliance and equipment maintenance.

4.3.5. Three of the men chosen should receive training in the United <u>Kingdon</u> on aircraft fire fighting and rescue. One of these men should be the Superintendant and one other should be selected as Assistant Superintendant.

4.3.6. The training of the remainder of the wholetime men should be the responsibility of the Superintendant through these trained men.

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4.3.7. In the selection of the wholetime men due regard must be paid to the arduous nature of fire fighting and the subsequent position they will hold within the Brigade. A system of selection should, therefore, be implemented which should describe and test for certain educational and physcial standards. Consideration should also be given to the inclusion of certain additional skills which will be of benefit to the Brigade for example previous training in the field of vehicle maintenance or carpentry since this would allow the Brigade to operate as a self contained unit more effectively.

4.3.8. The intention is, therefore, to establish a small unit of trained men who, whilst providing the necessary statutory cover for the airfield, will be of benefit to the community. There is, however, one important area which must not be overlooked and that is the relationship of those men to the volunteers and the provision of fire cover within Stanley during the night and weekends. The trained men must be capable of encouraging and training the volunteers and prepared to provide fire cover within the town. This is an area for discussion particularly since the men will be employed as firemen and the system of duty should The include nominal payment for standby hours. Superintendant and his Assistant should similarly alternate to ensure that one of them is always available. A simple rota system of duty could be formulated if necessary to ensure an equal distribution of hours between the mon.

4.3.9. It is proposed that these trained mon would be the first to respond to an incident and on the assessments made of the fire situation a general alarm could then be sounded to alert the Volunteer Section of the Brigade.

4.3.10. The nominal payment referred to would be in the form of a retaining fee and include the requirement for the wholetime men to attend a weekly evening training session, for the benefit of the Volunteers. An additional fee, previously agreed, may be made for actual attendance at fires and related to the hours the man has been engaged in fire fighting. Care must, however, be exercised in this respect since there will be occasions when both wholetime and Volunteers are working together and this could lead to friction between the two.

4.3.11. The wholetime members of the Brigade would as stated be responsible for the general maintenance of appliances and equipment. At present a handyman is employed for this duty. The reduction of this task would allow him to be usefully employed in the maintenance and servicing of fire extinguishers, store keeping etc.

4.3.12. If the system of organisation described in the previous sub-sections is implemented it will again be noted that there will be a necessity to provide a central station capable of accommodating both men and equipment and it is worth emphasising that for the system to work effectively and efficiently many of /many of the recommendations made in this report have this basic requirement.

4.4. VOLUNPEERS.

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4.4.1. The Volunteers will provide the important service of manpower. Under the direction of the wholetime force they would become far more efficient and effective. Their basic role would be of support.

4.4.2. The Volunteers should be encouraged to join the Brigade but they must accept two fundamental principles, regular training and team work. The requirement for educational background is not so important with these men but there should be a reasonable minimum standard of physical health.

4.4.3. The Volunteers section should be organised on the basis of one junicr officer to six men. One of the junior officers should act as spokesman and receive nominal payment for this function. This man should be directly responsible to the Superintendant of Fire Brigade who himself will provide the leadership and direction for the Volunteers. This relationship is most important if the two sections are to operate together as a complete Brigade.

4.5. INTERNAL ORGANISATION.

4.5.1. Dependent upon the degree of responsibility transferred to the Superintendant there will be certain areas of administration which he would be responsible for, including the financial budgeting for the Brigade. It is not, however, envisaged that there should be administrative staff since this is available within other Departments and arrangements could be made for its utilisation. The Superintendant must maintain certain records and examples of the type of local administration proposed are given below.

4.6. STATION LOG BOOK.

4.6.1. There should be a station log book. In this book the day to day situation of the Erigade is recorded, the men on duty, the availability of appliances, notes on visits carried out, movement of appliances and the recording of all fire calls with the action taken. The log should be in chronological order and signed at the end of each day by the man in charge of the statics at that time.

4.7. STANDARD TEST RECORD.

In this record book the results of all tests are recorded and the action taken.

4.8. HYDRANT REDCORDS.

A system of recording the information gained from routine testing of hydrants should be maintained giving date, result and signature. The system should be on going to ensure a flow of inspection work throughout the year.

4.9. EQUIPMENT RECORDS.

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There should be a system of recording details of equipment including vehicles. The record should show date of purchase, major repairs and defects found. This will enable accurate assessments and forecasts to be made concerning expenditure and quality of equipment in service with the Brigade.

4.10. EXTINGUISHER RECORD.

A system of recording the location and date of servicing extinguishers should be implemented preferably on a premises basis so that routine inspections can be carried out correctly.

4.11. INCIDENT REPORTS.

A standard form should be adopted for recording attendance at incidents and action taken. A copy of each report should be forwarded to the Chief Secretary as soon as possible after each incident. See Appendix 4.

4.12. SPECIAL SERVICE REPORTS.

A standard form should be adapted for recording details of these services which are chargeable. Incidents involving life or animals should be entered on incidents reports. See Appendix 5.

4.13. PRE-PLANNING FOR INCIDENTS.

There was little pre-planning for incidents. Regular inspection and exercises at the major risks is the most satisfactory method of assessing and pre-planning and the practice now in operation should be continued.

SECTION 5.

APPLIANCES AND EQUIPHENT.

5.1. GENERAL.

5.1.1. The Brigade has available basic equipment for fire fighting. This equipment was found in some cases to be in very poor condition due mainly to lack of maintenance.

5.1.2. Appliances available include two firefly landrovers and one hose laying lorry. One further vehicle a Carmachael Redwing landrover is awaited following a Consultant's recommendatica for the new airfield.

5.1.3. Four trailer mounted pumps are in service, two being new and the remaining two being portable trailer mounted pumps. The two new pumps have recently replaced two wartime pumps. Some pumps are of the light alloy type which is prone to salt water corrosion if not properly flushed out after use. The new pumps are, however, of gunmetal.

5.1.4. The mobility of this equipment is sometimes delayed due to the need to obtain suitable towing vehicles.

5.1.5. Appliances due to their size have little stowage room and small water carrying capacity. Phillips new ?

5.2. APPLIANCES.

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5.2.1. The general condition of appliances was poor but providing they receive adequate maintenance they will remain serviceable for a number of years. Mechanical attention was found fairly easily obtainable from the Public Works Department but there was no system of preventative maintenance.

5.2.2. To ensure the maximum useful life from these appliances a system of preventative maintenance should be implemented and in this respect the provision of a wholetime nucleus of firemen would be of considerable benefit. The appliances should be maintained to the highest possible standard to ensure that they will be entirely reliable at fires.

5.2.3. Due to the appliances limited size and weight carrying capacity it is necessary to distribute equipment normally carried by one appliance between three vchicles, and whilst this does not present too many difficulties it is a disadvantage since delays do occur in getting equipment to work. There is also the disadvantage of limited water carrying ability on appliances and the need to tow water tank trailers.

5.2.4. The firefly appliances are unsuitable for towing across difficult roads and terrain as found at the existing airfield.

5.2.5. It is considered that one major appliance carrying

500 galls of water would be the most suitable method of providing a realistic form of appliance. This type of vehicle would appear necessary if the category of the airfield is, as suggested, raised to the next highest level.

5.2.6. The requirements for the next category of airfield were discussed fully during the visit but there is little doubt that a major vehicle would be of considerable benefit to Stanley.

5.2.7. The two new water tank bowsers on order for the airfield should be permanently coupled to their respective landrovers so as to minimise personnel maximing levels and utilise the foam unit landrover to its full capacity. In addition the 1,000 gallon water bowser should be allocated to the Brigade with a tractor.

5.3. PUMPS.

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5.3.1. The pumps fitted to appliances and carried on trailers are generally in the 350-500 gallons per minute range. Priming systems are either of the water ring or exhaust gas ejector type. Little routine servicing has been carried out and this was apparent from the routine testing carried out.

5.3.2. The policy of gunmetal pumps is sound and should continue.

5.3.2. One of the two wartime pumps recently removed from service was found to be serviceable except for chassis damage and consideration should be given to making one good pump from the two available and this could then be utilised.

5.3.4. Routine maintenance should be implemented to ensure pumps receive adequate attention and fluching of pumps with clean water after they have been utilised for pumping salt water is essential. Simple precautions such as draining in winter and greasing whilst in use will also be of considerable benefit in extending the pumps useful life.

5.3.5. Light alloy constructed pumps were found to be showing signs of internal incrustation due to salt water and a programmed period of maintenance is necessary if these pumps are to remain in use. This programme should include the stripping down and cleaning internally of these pumps.

5.4. EQUIPHENT.

5.4.1. BRANCHES AND NOZCLES.

5.4.1.1. There are a variety of branches and nonzles within the Brigade. Some are in poor condition and unserviceable. Most branches are of the standard type. There are two revolving nozcles and one handcontrolled branch and one diffuser branch.

5.4.1.2. There should be at least one handcontrolled branch on each appliance. The existing branch is unserviceable. The type chosen should include on/off control, variable notate size and spray facility. This would allow maximum utilisation of water supplies.

5.4.1.3. The standard branches are of two types alloy and brass. Nozzles are generally 2" diameter. Most branches are useful but some nozzles are damaged internally. This has the effect of destroying the nozzle pattern and thereby produces as poor jet. The poor mains water supply would not be sufficient in many cases to produce a satisfactory jet.

- 5.4.1.4. Each appliance and pump should carry at least two branches. On pumps the nozzles of $\frac{1}{2}$ inch and $\frac{1}{2}$ inch should be fitted to the branch. On appliances two $\frac{1}{2}$ inch nozzles should be fitted and one $\frac{2}{2}$ inch and one 1 inch nozzle carried in addition.
- 5.4.1.5. Two large diameter branches of the fog major type with nominal outputs of 300 gallons per minute should be provided. These branches would be extremely useful at a major incident for effective water curtain tactics and at the oil installation for cooling purposes.
- 5.4.1.6. Two ground monitors would also be useful for use at incidents with major branches where in use. This type of equipment enables the branches to remain working in positions which are untenable by firemen whilst at the same time relieving the firemen of the strain of handling such a large branch as a fog major.
- 5.4.1.7. Hose reel nozzles and branches of the integral type with hermaphrodite couplings should be obtained. The branch should have a jet spray capability and there should be one spare branch. The branch should have an on/off facility.
- 5.4.1.8. A hose reel adaptor of the standard male instantaneous to hermaphrodite coupling should be provided on each appliance.

5.4.2. LADDERS.

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- 5.4.2.1. Two short extension ladders and two 30 ft extension ladders are available. A third short extension ladder is awaited. There are also numerous home made first floor ladders available throughout Stanley. One of the 30 ft extension ladders requires repair whilst the other has been refurbished during the inspection. These ladders are suitable and generally adequate for Brigade. There is a need for a roof ladder or the modification of a short extension ladder so that it may be used safely for roof work.
- 5.4.2.2. All the Erigzdes' ladders were examined and subject to standard testing and damage was found to have been caused to one ladder due to it being carried on a vehicle without a properly constructed gantry.

5.4.3. ROPES AND LINES.

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- 5.4.3.1. The Brigade had no ropes or lines available. Two inch manilla was therefore purchased and long and short general purpose lines made. Each appliance now carries a long and short line and each trailer pump a short line.
- 5.4.3.2. One lowering line is awaited and it is considered that a further lowering line be obtained together with two guide lines for use in conjunction with these rescue lines.

5.4.4. HAND PUMPS AND CHINENEY GEAR.

- 5.4.4.1. Two sets of chimney rods and one stirrup pump are available. The stirrup pump is damaged. A new pump should be obtained and the old one repaired and kept as a spare.
- 5.4.4.2. A hearth kit comprising of the following equipment should be made up and carried with the chimney fire equipment:-

4 inch Bolster, $\frac{1}{2}$ inch and 1 inch cold chisels, 41b lump hammer, 8 inch pliers, floorboard saw, hacksaw with spare blades, large flat screwdriver, small flat screwdriver, crosshead screwdriver.

5.4.5. RUBPER GLOVES AND INSULATED PLIERS.

These gloves, which are tested to 15,000 volts, but used up to 3,300 volts, are used when it is necessary for a fireman to work close to live electrical circuits for the purpose of rescue or averting disaster. Two wets should be obtained since they will need periodic annually testing.

5.4.6. COLLECTING HEADS.

Each pump should have a collecting head fitted with a minimum of two inlets. The inlets should have non-return valves.

5.4.7. CANVAS BUCKETS.

It would be useful for each appliance to have two canvas buckets which occupy little space but are extremely useful on grass fires.

5.4.8. BREAKING IN GEAR.

For achieving mapid entry into secured premists a pair of large bolt croppers and sledge hammer should be provided. This equipment can be obtained locally and should be carried by one appliance.

5.4.9. SALVAGE EQUIPHENT.

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- 5.4.9.1. Six salvage sheets should be obtained. The theets made from heavy canvas or proofed nylon material a pasuring 12 ft by 12 ft are most commonly used for making water dams, protecting goods/furniture from the water used for fire fighting and making temporary repairs to damaged roofs.
- 5.4.9.2. A number of small dollies should be made. These are lengths of old hose filled with sand or sawdyst and are used to place across doorways to prevent water entering unaffected parts of a building or for directing water out of a building.
- 5.4.9.3. A one and a half inch auger should also be obtained so that a hole may be made in a floor or ceiling to allow water used in fire fighting to drain away without causing too much structural damage.

5.4.10. ASPESTOS GLOVES AND BLANKNETS.

- 5.4.10.1. Due to the health dangers of this material blankets and gloves now used in the United Kingdom are usually of glass fibre for blankets and chrome leather for globes.
- 5.4.10.2. The Brigade also has available two close provimity suits of asbestos and in view of the hazard their use should be discontinued.

5.4.11. PERSONAL HOUTPHENT.

Apart from safety helmets of the industrial type the Brigade has no personal equipment for its men. Personal equipment in the form of fire boots, overtrousers, fire tunics and helmets is essential for personnel safety and comfort. The proposed wholetime men should be suitably equipped. This is not so important for the Volunteers but in view of the need for their involvement consideration should be given to the basic provision of a tunic and boots.

5.4.12. HANDLAMPS.

There should be at least two heavy duty handlamps on each appliance.

5.4.13. FOAM EQUIPMENT.

5.4.13.1.

The Brigade is counted with 2 No 10 type foam making branch pipes and 2 x No 5 foam making generators are on order.

5.4.13.2. One appliance is equipped with a built-in foam proportioner capable of producing 2,500 gallons per minute finished foam. This unit is equipped with a 75 gallon tank for form compound but due to difficulties of water supply in Stanley the tank contains water and the proportioner is not used, inducement of compound being at the branch using a pick-up tube. The Brigade has 200 gellons of foam compound in stock with a further 90 gallons awaited. There is a requirement for a stock of 90 gallons to be maintained for airfield use. Some of the compound in stock is showing clims of deterioration due to sludging and damaged containers.

5.4.13.3. The supply of compound should be increased to 600 gallons, of which at least 500 gallons should always remain in stock. Two additional No 10 foam making branchpipes should be provided if the proposed jetty and development of YPF installations proceed.

5.4.14. BREATHING APPARATUS.

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Pr.D simular ? 5.4.14.1. The Brigade has three compressed air breathing apparatus sets of French design. A small compressor has also been obtained from 'La Spritechique' for use with the B.A. sets. The sets are of the positive pressure type, two are single cylinder units whilst the other has twin cylinders. There are no spares. BA control equipment including control board, guide lines and distress signal units have been obtained from Cheshire Fire Brigade. There are, however, only manometer type gauges on the BA sets.

5.4.14.2. This French equipment is considered suitable and appears to be of good manufacture. However, to ensure safety of wearers the manometer should be changed if possible for normal pressure guages which the wearer can see at all times.

5.4.14.3. There should be spare cylinders to each breathing apparatus set.

5.4.14.4. The amount of equipment available is insufficient to enable a concerted attack to be made in breathing apparatus within a larger building and there is a need to have sufficient dressed men standing by whilst men are working within such a building.

5.4.14.5. It is considered that there should be a minimum of four and preferably six sets available at an incident. Compressed air presents less problems than oxygen for servicing and this should be the type adopted.

5.4.14.6. This additional equipment should preferably be of an identical pattern to that already supplied so that spares may be kept to a minimum.

5.4.14.7. Breathing Apparatus requires a high degree of attention if it is to remain in a high state of efficiency. Routine servicing is essential and for this reason an English translation of the servicing instructions was obtained.

5.4.14.8. Certain spares should also be obtained so that sets may be recaired culckly and serviced regularly. The items which may need frequent replacement such as rubber mushroom exhalation valves should be obtained and there should be at least one complete facemask and reducing assembly available.

5.4.14.9. The maintenance of this equipment should be entrusted to one or two individuals.

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5.4.14.10. Routine servicing for breathing apparatus is described in the Fire Services Drill Book and in the manufacturers instructions.

5.4.14.11. Additional distress signal units and personal lines should be obtained for each set plus handlamps of the fully approved type for use in flammable atmospheres.

5.4.14.12. The sets at present in use were found to have been discoloured by the use of coloured smoke used for training. The use of this type of smoke should be discontinued and only smoke canisters of the type approved for use with Breathing Apparatus in the United Kingdom used or small sawdust fires as demonstrated to the Superintendant.

SECTION 6.

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STANDARD TESTING OF APPLIANCES AND HOUIPMENT.

- 6.1. The importance of routine testing and examination cannot be over-emphasised since the efficiency of a Fire brigade is directly related to the efficiency of its equiptent.
- 6.2. Equipment examined revealed serious defects, in sche cases sufficient to have caused injuries to firemen. A copy of the Fire Service Drill Book was given to the Superintendant and he was instructed in the application and interpretation of the routine tests.
- 6.3. Appendix 2 describes a routine sequence of testing which should be implemented and Appendix 3 dotails some of the tests and the defects found.
- 6.4. The results of each test should be recorded in a Standard Test Record.
- 6.5. Efficient and appropriate means should be implemented to ensure that any defect is rectified immediately or that other necessary action is taken to ensure the defect will receive the necessary attention or replacement and details should be recorded in the Standard Test Record.

SECTION 7.

MOBILISING AND CONTUNICATIONS.

7.1. GEMERAL

- 7.1.1. The existing system of mobilising consists of the telephone operator telephoning the Superintencant or Assistant Superintendant following a receipt of a call. A decision is made by either of the two as to what response should be given ie. one appliance with both men or a general alart.
- 7.1.2. The general alarm is given by sirens and on its sounding some Volunteers report to their resp ctive stations to collect appliances whilst others proceed to the fire, the address being broadcast on the local radio.
- 7.1.3. The telephone operators are given authority to operate a general alarm should they be unable to contact either of the two Officers previously mentioned or if they under-stand from the information they receive that a serious fire has occurred.
- 7.1.4. The telephone system does not have any priority signal so delays to callers can and do occur.
- 7.1.5. The Brigade was equipped with 3 portable radio handsets with a common talk facility to each set but at the time of the visit this equipment was not functioning correctly.
- 7.1.6. Radios are not fitted in existing appliances. However, the appliance on order for the new airfield vill have a fitted radio. A further radio will be fitted in the Airfield Manager's landrover and a portable radio provided for the air/sea rescue boat. The base control for these three mobile radios will be in the Air Traffic Control Centre of the Terminal Building to the new airfield.

7.2. Exchange Telephone.

Investigations should be made to see if an emergency facility can be provided for the public teleptone network. This could consist of a simple relay operated by giving a number of 'rings' on the telephone handset and sounding a loud audible alarm in the telephone exchange and allowing the operators to answer that call in preference to any other.

7.3. Nobilisinr.

7.3.1. Consideration should be given to the provision of personnel alerters. These electers would be carried by

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wholetime members of the Brigade and operated simultaneously from the telephone exchange by a suitable transmitting unit.

- 7.3.2. It is understood that a joint unit with facilities for police and hospital personnel has been considered and the benefit of this type of equipment is considerable in ensuring a rapid response.
- 7.3.3. The men who respond to a call should report to the proposed central station, man their appliances and proveed to the incident.
- 7.3.4. The degree of response should be not less than two appliances within Stanley for any fire due to the poor water supply and tank capacities of the appliances.
- 7.3.5. For fires within risk buildings eg. Hospital, East Jetty, etc. a general alarm should automatically be sounded without reference to anyone. The men responding to a general alarm should follow a pre-planned form of action to ensure that should the fire be a serious one water relays can be effected, within the shortest practical period. This means identifying locations to which pumps are to proceed. The plan must, however, remain flexible to cater for changing conditions.

7.4. Communications.

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The existing radios will shortly be supplemented by some radios supplied by a local resident. The use of this equipment will greatly improve effective communication on the fireground. SECTION 8.

TRAINING.

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GENERAL.

- 6.1. Training of Brigade personnel is essential if the Brigade is to function effectively on the fire ground.
- 8.2. At the time of the visit no regular training was undertaken and men tended to stay in one unit unaware of the general duties undertaken by another unit.
- 8.3. Basic training to cater for the general dutics expected of any fireman is important. Where special skills are required such as breathing apparatus it would be reasonable to confine this to a smaller proportion of the brigade who could then become proficient and experienced.
- 8.4. There are special difficulties in airfield firefighting and personnel engaged in this field should have a sound professional training. In addition there should be a nucleus of skilled men who can assist and train the remainder of the Brigade by instruction and personal involvement.
- 8.5. The Superintendant should be trained to the general standard of a Station Officer in the United Kingdom.
- 8.6. During the period of attachment to Stanley instruction was given to both a small number of men on a 2 week basic training course and to other members of the Brigade. A pattern of regular training was established and it is hoped that this will continue under the guidance of the men trained for two weeks.
- 8.7. It would be advantageous if the men selected for airfield training were those who undertook the 2 week course.
- 8.8. The pattern of training given is summarised in Appendix 7. This pattern should be continued at a weekly training session lasting for about 2 hours each week, for the Volunteers. The pattern should be amended and interspersed with exercises to maintain enthusiasm and test pre-planning for major fires. The plan should be altered to suit the experience gained from the exercise.
- 8.9. Difficulty was found in having men attend regular sessions and only a small number of men did continue to attend regardless of other considerations.
- 8.10. Information is necessary for training to ensure that practices and equipment are to modern standaris. In this respect it would be useful to maintain liaison with the British Fire Service either directly through Government or by way of periodicals such as 'hire' magazine.
- 8.11. The Senior Public Works Mechanic should also receive training in the United Kingdom on fire pump maintenance if this can be arranged.

SECTION. 9.

HOSE.

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9.1. GENERAL.

9.1.1. The Brigade has available over 100 lengths of delivery hose and 12 lengths of suction hose. Nost of the delivery hose is new $2\frac{1}{2}$ inch duraline with gun metal instantaneous couplings. There are also a number of canvas and canvas rubber lined hose. Suction hose is of the partially and fully embeded type with alloy couplings.

9.1.2. There is a semi-horizontal drying platform and a damaged hose coupling binder.

9.1.3. There is little storage facility for hose other than on vehicles and no hose had been subjected to; standard testing. Many of the new lengths of hose were still in their original shipment coverings.

9.2. CANVAS AND RUEBER LINED DELIVERY HOSE.

This hose has received little attention during many years. Some lengths were found to have rotted through completely. This hose was examined and a few lengths found serviceable. However, it should not be utilised for normal fire fighting duties but kept in reserve for those occasions when special services are required or for use on peat fires where it will not be so important if damaged and its percolating effect can be put to good use.

9.3. DURALINE DELIVERY HOSE.

9.3.1. This hose is of high quality and used by many Brigades in the United Kingdom. It requires less maintenance than rubber lined hose in that it is not necessary to dry it completely after use. However, precautions taken with the hose will ensure a number of satisfactory years performance. In particular the hose should not be left permanently rolled on appliances. It should occasionally be re-rolled to prevent it taking on a permanent set and when in storage it should be in a cool, dry and well ventilated place on racks. The couplings will require little attention other than a periodic cleaning and ensuring that the moving parts can move freely. More Damage is caused to this hose by its misuse e.g. being dropped, couplings run over by vehicles, dragged on the fireground, than due to matural hazards.

9.3.2. The manufacturers are satisfied that no damage will occur from salt water exposure if gunmetal couplings are used.

9.3.3. Delivery hose should once a year be subjected to a standard test. This involves (radually building up the pump pressure to 150 pounds per square inch whilst using a $\frac{1}{2}$ inch nozzle. At this pressure any defects will be seen and the hose placed for repair. The couplings are examined, defective washers made good and instantaneous couplings lightly lubricated and adjusted if necessary.

9.3.4. Ten 75 ft length of $1\frac{1}{4}$ duraline hose should be obtained for use as branch lengths. There should be 2 lengths on each appliance.

9.4. SUCTION HOSE.

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9.4.1. The suction hose in service is not new but some of it is still in serviceable condition. One length was found to have been crushed after being run over by a vehicle whilst another 3 lengths had damaged couplings due to misuse. There is a need for additional suction hose since two recently purchased pumps arrived without suction hose and lengths of 1940 hose were found unusable.

9.4.2. New suction hose purchased should comply with the British Specification for Fire Brigade use and various types of suction hose are available which are more flexible and lighter than the older types of hose at present in use e.g. 'Beliflex'.

9.4.3. A light greasing of graphite is suitable for keeping screw couplings in good working order.

9.5. REPAIR OF HOSE.

9.5.1. No equipment exists for the repair of hose although equipment had once been purchased.

9.5.2. The suppliers of the existing hose is able to offer full details of the repair equipment available and provision should be made for one vulcaniser and hose repair materials.

9.5.3. A new hose coupling binder is also required together with a supply of binding wire.

9.6. HOSE DRYING.

The existing drying facility is unsuitable in that it does not dry the internal surface correctly. A simple drying facility would be the provision of a pulley and whip placed sufficiently high on a building or pole to allow the hose to be hung vertically. The hose should be hung with both couplings facing down to ensure complete drying of internal surfaces. It would be of advantage if this provision could be made within a building.

9.7. HOSE MARMING.

To facilitate maintenance of hose all hose should be indelibly marked numerically. This enables a length to be readily identified and records to be maintained following annual hose testing or repair.

9.8. HOSE REEL TUBILS.

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Some hose real tubing is showing signs of deterioration. A spare length of 60 feet $\frac{3}{4}$ inch tubing should be acquired and tubing should be fitted with hermaphrodite couplings.

9.9. SUCTION EQUIPMENT.

9.9.1. SUCTION WREACHES.

At present two differing types of wrench are in use (a) the conventional type and (b) the universal type. Damage to suction hose couplings referred to earlier appears to be due to the misuse of the (a) type wrench. This type of wrench is a little difficult to handle but in the case of the damage noted it appears that the wrench had been used as a hammer. Whenever wrenches are specified or require renewing it would be wise to specify type (b) Universal. There should be a pair of wrenches on each pump.

9.9.2. SUCTION BASKET STRAINERS.

Only two basket strainers are available and one of these has no canvas skirt. The use of this type of basket greatly reduces possible damage to a pump impellor due to small objects and assists flow when working from open water and the strainer is resting on a soft surface such as mud. Each pump should have a basket strainer.

9.9.3. LOW LEVEL STRAINER.

A low level strainer would be a useful addition to equipment.

9.9.4. INTERNAL STRAINERS.

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All pumps should be fitted with internal strainers in the pump eye. These strainers will reduce the possibility of solid objects entering the pump particularly when working direct from a hydrant.

SECTION 10.

EXTINGUISHERS.

10.1. GENERAL.

There are a number of differing types of extinguishers in premises and on appliances. This can present difficulties of maintenance. The Fire Brigade have available a range of equipment generally suitable for re-charging stored pressure type extinguishers and gas cartridges. However, the equipment cannot charge Carbon Dioxide types of extinguishers and small gas cartridges. There appears to be no other body in Stanley capable of re-charging or competent in extinguisher maintenance. The Brigade also maintain all Government Department extinguishers and carry a small stock of various charges. A number of Carbon Tetrachloride extinguishers are still in use. The system of maintenance does not include compliance to British Standard Code of Practice 402. It has been suggested that the Brigade assume the role of servicing extinguishers in general.

10.2. EQUIPMENT AVAILABLE.

- 10.2.1. The servicing equipment available was found to be in good working order and it may be possible for the equipment to be extended to include the additional items necessary to re-charge the smaller carbon dioxide gas cartridges since these are now in general use.
- 10.2.2. The re-charging of Carbon Dioxide extinguishers may, however, present considerable difficulties regarding the initial provision of equipment. It is also necessary for this type of extinguisher to be pressure tested every five years and this equipment is not available.

10.3. STOCK SPARE CHARGES.

A system of stock control should be implemented to ensure adequate supplies are always available both for routine servicing and to cater for the occasionally heavy demand. There is not enough stock at present.

10.4. STANDARDISATION OF EXTINGUISHERS.

To reduce stock and equipment requirements to the minimum extinguishers should preferably be of the same types. Water extinguishers should, for example, be of the gas cartridge types and the use of soda acidextinguishers should gradually be phased out. In this respect discussions with the FIC

could reduce the types at present being sold to certain models.

10.5. CARBON TETRACHLORIDE EXTINGUISHERS.

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This type of extinguisher should be replaced by vapourising liquid extinguishers of the Bromochlorodiflucromethan(BOP) type. It has for some time been known that CTC which is similar and related to chloroform, can be extremely dangerous in enclosed spaces. Cases of fatality have been recorded and in addition on a hot surface such as metal, the carbon tetrachloride breaks down and can form phosgene the extremely poisonous gas.

- 10.6. INSPECTION OF GOVERNMENT EXTINGUISHERS.
- 10.6.1. Extinguishers in Government Departments should be maintained and inspected in accordance with British Standard Code of Practice 402.
- 10.6.2. Extinguishers belonging to the Fire Brigade should be maintained and inspected in accordance with the Fire Service Drill Book.
 - 10.7. EXTINGUISHERS RELONGING TO THE GENERAL PUBLIC.
- 10.7.1. Whilst there is merit in the provision of a service to the general public there are a number of considerations to be taken into account before this service can be provided:
 - The public are entitled to purchase extinguishers from any source.
 - The public need to be convinced or required to have regular servicing.

The types of extinguishers at present in use vary in type.

There must be an economical price charged for each extinguisher inspection and additional charged if defects have to be rectified.

10.7.2. With regard to purchase the Government do already sell extinguishers to individuals and the scale and types of extinguishers obtained by individuals is not controlled within private dwellings. Advice should, therefore, be offered and extinguishers sold at a non-profit making level to encourage individuals to purchase from the Government or the joint decision made with FIC to limit the types being sold.

10.7.3. Regular servicing is important if extinguishers are to remain in good condition and useful. Private individuals again should be advised on the proper methods of cervicing and induced to use the Government service on the basis that they will know that their extinguishers are being properly maintained. It would, however, be difficult to insist by legislation that everyone buys their equipment from the Government and only the Government service the equipment.

- 10.7.4. Where re-charging is necessary this should be related to the average time and materials used. A fixed charge per extinguisher and per re-charge would be preferable for all types of extinguishers rather than one for each particular model. The charge must, however, be economical and include a small margin for equipment depreciation and higher cost of new charges. The price should also be fixed to cater for the more expensive re-charge at the expense of the simple re-charging.
- 10.7.5. It is suggested that a 6 month trial period be adopted and dependant upon its success or otherwise a firm decision made at its conclusion.
- 10.7.6. The general scale of recommendations for individuals is considered reasonable ic. 2 x 2 gallon water extinguishers per house but where oil fired heating/cooking is used a 4 lb Dry Powder extinguisher would be ______ advantageous.

10.8. GOVERNMENT VEHICLES.

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No extinguishers are provided on Government vehicles. Each vehicle should have a 1.51b BCF extinguisher.

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11.1. ATEMIELD FIRE FIGHTEN.

- 11.1.1. Airfield fire fighting is an area which requires special consideration due not only to the large life risk involved but the nature of the fires likely to be encountered.
- 11.1.2. A new airfield is shortly to be opened at Cape Penbroke and equipment has been ordered to exter for this following a Consultant's report. The equipment schedule has been examined and the airfield visited.

11.2. AIRLIED.

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- 11.2.1. Whilst distant from Stanley the airfield will have good road communication. The site has very difficult terrain surrounding the single runway. Water supplies are difficult and a 20,000 gallon fresh water tank has been sited near to the terminal building and fitted with hose and suction couplings.
- 11.2.2. The aircraft utilising the airfield will be the same as at present i.e. Fokker F27 Friendship, although there is a possibility that F28 Friendship aircraft may come into service. Flights are normally limited to one per week.

11.3. EQUIPHENT.

- 11.3.1. The equipment specified appears to be in accordance with the Civil Aviation Authority publication CAP 168 for a category IV airfield i.e. 600 gallons of water, 30 gallons of foam compound and 100 lbs of dry powder. In addition a 50lb Carbon Dioxide extinguisher, rescue trailer and inflatable for sea rescue is being provided. A Carmachael landrover appliance together with the existing (foam) landrover appliance and a new airfield manager's landrover are intended to tow the various units including 2 x 250 gallon water tank trailers.
- 11.3.2. Reserve supplies of supplementary agents are included to the Civil Aviation Standard of 100% and foam compound to the same standard of 200%.
- 11.3.3. It should be noted that the International recommendations (ICAO) are at variance with CAP 168 and this matter has been discussed with the airfield Superintendent.

11.4. PR-CTICAL CONSIDERATIONS.

11.4.1. The type of aircraft in use has a fuel capacity of approximately 1,100 gallons (or 1,500 gallons with pylon tanks) when fully laiden. Passengers and crew rarely exceed 40 persons.

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11.4.2. The most common forms of serious accidents tend to arise either on take off or landing.

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- 11.4.3. The successful control and rescue at fires requires a rapid response, generally accepted as an appliance being in action at an incident on any part of the airfield within 3 minutes of raising the alarm. To achieve this CAP 168 outlines on acceleration from rest to 80 kph in 45 seconds and a crubing speed of 80 kph for a fully laden appliance.
- 11.4.4. Practical tests conducted with the existing foam landrover appliance towing a 250 gallon tank trailer indicate that acceleration is reduced to a maximum of 70 kph and movement across ground adjacent the existing temporary zirfield is very slow and on some occasions impossible.
- 11.4.5. Additionally it should be noted that if the FC8 comes into general service the ICAO recommend a rapid intervention ' appliance and a major appliance (category 4).
- 11.4.6. A landrover towing a trailer could not be regarded as a 'major' appliance.
- 11.4.7. Should an aircraft be subjected to a sustained fire it is doubtful if the mobile water supplies envisaged would be sufficient since the intention of the minimum standard is to save lives and tackle the incipient fires.
- 11.4.8. It is considered that a major appliance should be provided.
- 11.4.9. In addition attempts should be made to resolve the category of the airfield under the ICAO recommendations and the standards required implemented.
- 11.4.10. The threshold and departure areas have been chamined in detail topographically and consideration should be given to the construction of emergency access roads suitable for appliances. Particular attention should also be given to access for the vehicle towing the inflatable boat down to a suitable launching position.

11.5. AIRFIELD FACILITIES.

11.5.1. There should be suitable facilities on the sinfield for the fire crews to rest and store the necessary preserve supplies.

11.5.2. Since it is envicaged that these mon are utilised for various

other duties there will presumably be a need for storage of other plant and equipment and this provision should be combined.

11.6. MANFOWER.

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- 11.6.1. It is intended that 3 vehicles form the basis of the airfield rescue service. Should a major vehicle be provided as recommended this could replace two of those whits is. the rescue trailer and one landrover appliance, by incorporating the equipment onto the one vehicle.
- 11.6.2. At present a minimum of 4 men are required to man one appliance.
- 11.6.3. This figure should be increased to at least 6 provided water tanks can be permanently connected to landrotor appliances and the foam unit fully utilised.
- 11.6.4. To cater for leave, sickness etc. it is suggested 8 men be appointed for airfield duties and 3 of these men receive thorough training in airfield fire fighting and rescue. See paragraph 4.3.3. regarding manning requirements.
 - 11.7. MEDICAL FACILITIES.
- 11.7.1. Basic medical facilities in the form of bandeges, dressings, stretchers and blankets should be provided at the airfield together with a trained person capable of first aid.
- 11.7.2. A suitable ambulance on site would also be of benefit during flying.
 - 11.9. TRAINING.

It is understood that consideration is being given to suitably training the airfield emergency service personnel. It is suggested that the advice of the Royal Marine detachment in Stanley may be of considerable benefit in the training of personnel for sea rescue duties. SECTION 12.

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WATER SUPPLIES.

12.1. Domestic Listribution Supply - General Description.

The Water Authority for Stanley is the Falkland Islands Government.

The domestic supply is provided under the direction of the Superintendant of Public Works.

The supply is drawn from a brook, 3 miles west of Stanley, known as Moody Brook. After extraction the water is suitably treated at a small treatment works adjacent the supply and is then piped overland to two reservoirs on high ground above Stanley known respectively as Dairy Paddock and Sappers Hill Reservoirs. Sappers Hill Reservoir is approximately 155 feet above sea level and Dairy Paddock 110 feet above sea level.

The domestic distribution mains system is in many areas quite old and of cast iron pipework.

Investigations into the existing supplies available within Stanley for fire fighting are shown in Appendix 10.

Hydrants provided were found to be of varying types and lacked uniformity, necessitating differing stand pipes. Hydrant pits again varied although generally there was sufficient clearance within pits.

Prior to arrival a domestic fire had occurred in Davis Street, Stanley and the Brigade had found it necessary to implement a salt water relay from the Public Jetty in order to obtain an effective fire fighting supply.

This relay was for a distance of approximately is mile mainly uphill (Davis Street is approximately 105 feet above sea level) and unfortunately due to the time factor involved in establishing the relay and the failure of a large number of lengths of delivery hose the property was a total loss.

12.2. Domestic Supply for Fire Fighting.

12.2.1. The existing supply for fire fighting is inadequate particularly in the area of Davis Street and Fitzroy Road.

> The smallest practicatle jet requires a flow of 35 gpm if it is to be effective but due to the problem of high winds it is doubtful if such a small jet would be sufficient to prevent the spread of fire

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from one property to another.

There will be shortly 1,750 gallens of mobile vater plus the small tanks of appliances if the water bowsers purchased for airfield use are fully utilized.

This supply would allow only a short period of operations during which a salt water relay would have to be established.

Along the foreshore this would not present too many problems but in the area previously mentioned there would be delay. It is considered that there should be a new ring main in this area and that the lower level: mains should be linked into this new main to improve the existing flows.

This matter has been investigated with Mr. A. Smith of Crown Agents and a suitable scheme will be produced.

12.2.2. All Hydrants should comply with British Standard Specification for Hydrants 750/ 1977 and preferably be of the screw down streamline pattern with a 2g inch round thread outlet. Indicator plates should conform to BCS for Hydrant and similar Indicator Plates 3251/1976.

12.3. Hydrant Testing.

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The Fire Brigade should implement a system of routine testing in accordance with the Fire Service Drill Book.

12.4. Emergency Water Supplies.

To supplement the domestic distribution system arrangements should be made to provide suitable pumping positions along the foreshore.

The positions chosen should be located as follows with a suitable ramp and tracks to allow pumps to be quickly positioned and with adequate suction sumps which can be kept weed free:-

Ross Poad West - Near West Jetty. Noss Road - Opposite Government House. Ross Road - Opposite Reservoir Road. Ross Road - Opposite Villiers Street. Ross Road East - Opposite Hebe Street. Ross Road East - Opposite MPF.

In addition there should be areas of the Government and Public jetties kept weed free and indicated for Fire Brigade use together with an area of the FIC slipway opposite Dean Street.

12.5. Hose Laying Vchicle.

The existing vehicle requires replacement and it is understood the Superintendant of Public Works has this matter in hand.

This vehicle is essential in ensuring minimum delays in laying hose and subsequent water relays. The new vehicle should have a properly constructed gantry for a 30 ft extension ladder and adequate stowage space for the additional equipment this vehicle is required to carry.

12.6. Fire Boxes.

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A system of 22 fire boxes exist within Stanley and the equipment usually comprises a standpipe, key and bar, branchpipe and $\frac{2}{4}$ inch nozzle and two lengths of hose. This equipment is generally in very poor condition.

Due to the poor demestic supply this equipment is of little benefit except in those locations where there is good flow and head e.g. Government House.

In those locations the equipment should be retained but nozzle sizes reduced to $\frac{1}{2}$ inch or $\frac{1}{2}$ inch to produce a satisfactory jet.

SECTION 13.

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FIRE PREVENTION - GENERAL.

13.1. The general standard of fire prevention found during inspections was extremely low particularly little emphasis had been given previously to the most important area of means of escape.

Means of escape from fire is an extremely complicated subject based on many assessments and knowledge acquired over many years and it would be impossible to define all the considerations taken, into account.

- 13.2. There can be little doubt that should a serious fire occur within some of the premises visited there would be a grave risk to life.
- 13.3. Many other areas have been examined during inspections and the recommendations made are the conditions found appertaining at the time of inspection. If alterations have been made then their effect must be considered particularly in respect of suggested fire separation and means of escape provisions.
- 13.4. It is strongly recommended that if new buildings are to be of a higher standard than found consultation with a qualified fire provention officer is essential at planning stage. Basic training of the Superintendant of Fire Brigade would similarly help to ensure that the standards recommended in the following reports are maintained and not negated by subsequent minor alterations or personnel action.
- 13.5. The recommendations made reflect only a reasonable standard and could if wished be extended to provide a higher standard. They are, however, considered realistic to conditions appertaining to the Colony.
- 13.6. Recommendations are made to line certrin walls to provide a half hour degree of fire relistance.

It was very difficult to assess what theterials had been used and if any internal insulation such as glass fibre or mineral wool had been theiled within the studding.

In those situations where it is known the construction complies with the recommended constructions given in Appendix 11 the lining of partition wills may be disregarded. Similarly in the brief description given of premises metal sheeting is often stated as the wall. It must be remembered that in many inclunces timber walls and framework are the structure and the metal sheeting is a cladding.

7. Poor installation of cil fired burning equipment and bad and unsafe practice with the use of flammable liquids were also found.

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The fuel generally used for oil firing was diesel oil. Whilst the flash point of the liquid may normally be above ambient temperature it should be noted that on oil fired installations faults do occur and burning fuel may easily escape to ignite surrounding areas. This is obviously extremely hazardous if the heating chamber is within a building and the storage tank is sited adjacent without any form of fire separation between the building and the chamber.

- 13.8. Flammable liquids and particularly petroleum spirit were seen to be used in conditions which were extremely dangerous, and action was taken to try and prevent serious, even fatal, occurrences. It must be emphasised that simply because accidents have not occurred previously there is no risk. The risk is high and every practical precaution must be taken. The safe control of these liquids is essential.
- 13.9. The nature of construction used in many buildings precludes many fire separation technicues without considerable expense. Buildings of entirely timber construction were seen and compartmentation, the normal method of fire separation, would result in major building works. However, where considered necessary for means of escape or to remove a major risk e.g. oil fired heating, recommendations have been made.
- 13.10. Protection of structures of major importance could be achieved by sprinkler installations but practical difficulties of water supply is a major limiting factor.
- 13.11. Early calls, via automatic fire detection, could help reduce the risk of particularly serious fires and may be considered suitable for essential Government or commercial buildings.
- 13.12. Because of the risks to buildings it is important that controls to prevent the transmission of fire from one building to another be made. The areas covered would include location of buildings, internal roof covering and external cladding.
- 13.13. There can be little doubt of the difficulty which will arise in the implementation of recommendations. The consideration of cost is not within the scope of the surveys carried out but it is obvious that if serious improvements are to be made sufficient funds will have to be made available. However, parkages a major area of concern is that of skilled labour.

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The existing Fublic Works Department achieves remarkable success and there is no doubt that they could carry out the work involved. However, the size of labour force would either entail a considerable delay regarding implementation or the progression of this work at the detrement of other works.

If the works required are to be carried out over a period of time the priorities should be made on the basis of risk to life. In this respect the Hospital and Boarding School present major life risks whilst/the day time only occuptories risk is reduced. Means of escape recommendations should receive precedent over other works.

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13.14.

Only a few settlements were visited and advice can only, therefore, be given in general terms but the standard of fire protection detailed in many of the inspection reports applies equally particularly regarding fire equipment and use of ystroleum spirit and liquified petroleum gas.