

INSTRUCTIONS TO NDCC / AW STAFF FOR SEEKING AUTHORITY TO USE VENTILATION SHUTDOWN (VSD) TO KILL POULTRY DURING AN OUTBREAK OF HIGHLY PATHOGENIC AVIAN INFLUENZA

September 2009

Version 9

Terminology

VSD – Ventilation shutdown

NDCC – National Disease Control Centre

NDCC JCC – National Disease Control Centre Joint Co-ordination Centre

LDCC – Local Disease Control Centre

AW – Defra Animal Welfare Core Team

AWVA - Defra Animal Welfare Core Team Veterinary Adviser with responsibility for welfare at slaughter or killing

DC – Defra Disease Control Policy Team

CVO – Chief Veterinary Officer

AH – Animal Health Executive Agency

Defra – Department of Environment, Food and Rural Affairs

DoH – Department of Health

HPAI – Highly Pathogenic Avian Influenza

WASK – Welfare of Animals (Slaughter or Killing) Regulations 1995

Introduction

1. VSD can only be used to kill poultry during a Highly Pathogenic Avian Influenza (HPAI) outbreak where the Secretary of State is satisfied that it would be impracticable to use another permitted method of killing in the individual circumstances concerned. This must be confirmed in writing. Schedule 9 of The Welfare of Animals (Slaughter or Killing) Regulations 1995 (WASK) states:

“No person shall kill birds using ventilation shutdown except on the written authority of the Secretary of State who must be satisfied in the individual circumstances that any other method of killing listed in this schedule is impracticable.”

The killing methods authorised at Schedule 9 are listed in Annex A.

2. Authority to use VSD should not be sought unless a HP AI infection has been confirmed. When the use of VSD was debated in Standing Committee, Ministers confirmed that VSD would only ever be used as a last resort. They confirmed that all other permitted killing methods would have to be explored and discounted first and that there would need to be a serious and heightened concern over human and animal health before they would even contemplate the use of VSD. Ministers also confirmed that VSD would not be used unless resources are stretched beyond capacity e.g. as a result of multiple outbreaks where there are insufficient catchers available to catch birds or gas supplies / equipment shortages limit the availability of other killing methods.

3. If a possible need to use VSD is identified the NDCC JCC Field Operations Team should immediately inform the CVO, AW, and DC. AW should seek advice from DoH on the public health risk to the general population and those working to control the outbreak and consider whether the conditions set out in paragraph 2 have been met. AW will ask the NDCC JCC Field Operations Team for advice on the availability of other permitted killing methods and the risk that these will be overwhelmed if VSD is not deployed. If it is concluded that the conditions set out in para 2 have been met the use of VSD must then be considered on an individual case by case basis. It is not anticipated that these conditions would ever be met for any disease outbreak other than HPAI.

Case by case assessment

4. To ensure the Secretary of State can make an informed decision about the use of VSD for each specific case the NDCC JCC Field Operations Team should ask the LDCC to prepare a field report providing a comprehensive on-site assessment of the conditions (see VO/ROD Instructions on the Preparations of a Field Report on the Suitability of Buildings for Whole House Gassing (WHG) or Ventilation Shutdown (VSD) to Kill Poultry During an Outbreak of Highly Pathogenic Avian Influenza). The Secretary of State must not be asked to authorise the use of VSD until the field report has been received and analysed.

5. When the field report is received by the NDCC JCC Field Operations Team it should be copied to the CVO, AW VA and the AW policy head.

Other killing methods

6. VSD will not be authorised unless it can be established that all other permitted killing methods (see Annex A) have been carefully examined and it has been established that other permitted killing methods are impracticable and cannot provide the immediate intervention required to stop the spread of animal disease and address the potential threat to human health. To help determine whether this is the situation for every case the NDCC JCC Field Operations Team should provide an assessment (see Annex B) explaining why each permitted killing method is not suitable or appropriate for use in the specific circumstances involved. This assessment should include consideration of killing methods that have been used successfully in other Member States e.g. Foam, Carbon Monoxide, Nitrogen, Nitrous Oxide etc. even though they are not commonly used for onsite killing in the UK. This assessment should be sent with the field report to the CVO, AW VA and the AW policy head.

VSD suitability assessment

7. VSD will not be recommended where the site conditions are considered unsuitable. On receipt of the field report the NDCC JCC Field Operations Team VA should make an initial assessment of whether the site is suitable for the use of VSD. An assessment form for use in determining whether the site is suitable for VSD is attached at Annex C. Before finalising the assessment the NDCC JCC Field Operations Team VA should consult with the AW VA. Once completed the site suitability assessment should be sent to the CVO, NDCC JCC Field Operations, the AW VA and the AW policy head. The assessment should include a recommendation on the use of VSD and a recommendation on the additional heating capacity and number of heaters required (to supplement the heaters installed in the shed), to raise the temperature throughout the house to 40°C within a period of 30 minutes. A ready reckoner to use for this purpose is attached at Annex D. The conversion factors at Annex D are intended to ensure sufficient heat is applied to raise the temperature throughout the house to 40°C within a period of 30 minutes.

Recommendation

8. All recipients should analyse the information provided in the field report, the NDCC killing methods assessment and the site assessment. They should agree what recommendation should be made to the Secretary of State regarding the use of VSD.

9. The decision making process is summarised at Annex E.

10. To ensure the prompt killing of diseased poultry it is important to ensure a recommendation is agreed quickly. Once a recommendation has been agreed AW will prepare the final submission and liaise with the Minister's private office to ensure a prompt response. An outline submission is attached at Annex F. Wherever practicable the submission should go to

Ministers on the same day that the field report is received by the NDCC JCC Field Operations Team.

Approval

11. AW staff will liaise with the Minister's private office and will ensure that the CVO, NDCC JCC Field Operations Team and the Defra Communications Directorate are notified as soon as a decision on the use of VSD has been made. NDCC JCC Field Operations Team should immediately notify the LDCC Field Operations Team in writing of this decision. It will be particularly important to include details of the supplementary heaters required and to confirm the number of heaters and the heating capacity required.

KILLING METHODS LISTED AT SCHEDULE 9 OF WELFARE OF ANIMALS (Slaughter or Killing) Regulations 1995 as amended.

- (a) free bullet (not appropriate for poultry);
- (b) electrocution;
- (c) exposure to carbon dioxide or to a lethal concentration of other gases or gas mixtures;
- (d) for rabbits and birds, dislocation of the neck;
- (e) captive bolt, provided that—
 - (i) the animal is either pithed or the blood vessels in its neck are severed without delay afterwards and in any event before the animal regains consciousness; and
 - (ii) apart from the requirements in (i) above, nothing more is done to the animal before it has been ascertained that the animal is dead; or
- (f) lethal injection of—
 - (i) a drug with anaesthetic properties which causes rapid loss of consciousness followed by death; or
 - (ii) any other compound if preceded by the induction of anaesthesia
- (g) for birds, a pneumatic or cartridge operated percussive device producing immediate death, providing nothing more is done to a bird before it has been ascertained the bird is dead
- (h) for birds, ventilation shutdown provided that no one enters the building in which the birds are housed save for monitoring purposes until it is ascertained that all of the birds are dead.
 - No person shall kill birds using ventilation shutdown except on the written authority of the Secretary of State who must be satisfied in the individual circumstances that any other method of killing listed in this Schedule is impracticable.
 - No person shall cause or permit birds to be killed using ventilation shutdown unless under the direct supervision of an official of the Secretary of State

NDCC JCC FIELD OPERATIONS TEAM ASSESSMENT OF PERMITTED KILLING METHODS AND SUPPLEMENTARY HEATER AVAILABILITY

1. Assessment of available killing methods

Killing methods considered		
	Explain why it is not possible or suitable to use the method	When might it be possible to deploy method?
Containerised gassing Units		
Whole House Gassing		
On site slaughterhouse		
Electrocution		
Lethal Injection		
Percussion killers		
Cervical dislocation		
Other permitted killing methods (please specify) (e.g. CO, Foam etc.)		

Note: If it is possible to utilise one of the methods described above to kill birds immediately no further consideration should be given to the use of VSD

2. Availability of supplementary heaters

Are supplementary heaters available for deployment at this site?

Yes		No	
------------	--	-----------	--

Name:

Position:

Signature:

Date:

Telephone No:

VSD SITE SUITABILITY ASSESSMENT

Site name Location

House construction

Can house be sealed effectively?	Yes		No	
----------------------------------	-----	--	----	--

What heat input is required to raise the temperature inside the house to 40°C ?

Ambient temperature		°C
---------------------	--	----

How well can shed be sealed?			
Very poor	Poor	Average	Good
How well is House insulated?			
Poor	Average	Good	

Heat input required to reach 40°C (use ready reckoner)		Kw
--	--	----

Are house heaters operational?	Yes		No	
--------------------------------	-----	--	----	--

Can house heater thermostat be overridden / set to 40°C	Yes		No	
---	-----	--	----	--

Heat output of house heaters (if answer to either of the two questions above is no assume zero)		Kw
---	--	----

Supplementary heat input required		Kw
-----------------------------------	--	----

If supplementary heaters required:

Has LDCC confirmed supplementary heaters are available?	Yes		No	
---	-----	--	----	--

Can heaters be accommodated inside house?	Yes		No	
---	-----	--	----	--

Type of birds

Chickens (broilers)		Chickens (laying Hens)	
---------------------	--	------------------------	--

Geese		Turkeys	
-------	--	---------	--

Game / Other Birds		Ducks	
--------------------	--	-------	--

Note: The site should not be considered suitable for VSD if a tick has been placed in any box shaded red.

Assessment

On the basis of the information provided in the field report and the other information available to me I consider that the above site [is] [is not] suitable for VSD for [.....specify bird type].

To ensure the optimum conditions for successful VSD can be established supplementary heat totalling [.....kw] must be provided.

A minimum of [] supplementary heaters with an individual output of at least [.....Kw] should be used.

Name:

Position:

Signature:

Date:

Telephone No:

HEAT INPUT READY RECKONER

1. Conversion factors to be used to determine heat inputs for all poultry houses except very large houses with volumes of approximately 10,000m³ (e.g. a large cage house)

Poor insulation

Ambient temp	How Well House is Sealed			
	Very Poor	Poor	Average	Good
-5°C	9.6	11.3	13.5	16.7
0	10.5	12.2	14.5	17.8
5	11.6	13.3	15.8	19.5
10	12.8	14.7	17.2	20.5
15	14.5	16.4	18.9	22.2
20°C +	18.0	20.3	23.4	27.3

Average insulation

Ambient temp	How Well House is Sealed			
	Very Poor	Poor	Average	Good
-5°C	9.9	11.7	14.1	17.6
0	10.8	12.6	15.0	18.7
5	11.9	13.8	6.4	20.0
10	13.2	15.2	17.8	21.4
15	14.8	17.0	19.5	23.0
20°C +	18.5	21.0	24.3	28.3

Good insulation

Ambient temp	How Well House is Sealed			
	Very Poor	Poor	Average	Good
-5°C	10.3	12.2	14.9	18.8
0	11.2	13.2	16.0	19.9
5	12.3	14.4	17.2	21.1
10	13.7	15.8	18.6	22.5
15	15.3	17.5	20.3	24.1
20°C +	19.0	21.7	25.1	29.6

2. Conversion factors to be used to determine heat inputs for very large poultry houses with volumes of approximately 10,000m³ or more (e.g. a large cage house)

Poor insulation

Ambient temp	How Well House is Sealed			
	Very Poor	Poor	Average	Good
-5°C	10.7	12.7	15.6	19.8
0	11.8	13.9	17.0	21.4
5	13.1	15.4	18.6	23.2
10	14.7	17.2	20.6	25.3
15	16.9	19.5	23.1	27.9
>20°C	21.0	24.3	28.6	34.4

Average insulation

Ambient temp	How Well House is Sealed			
	Very Poor	Poor	Average	Good
-5°C	11.0	13.1	16.2	20.8
0	12.1	14.4	17.6	22.3
5	13.4	15.9	19.3	24.2
10	15.1	17.7	21.3	26.3
15	17.3	20.1	23.8	28.9
>20°C	21.5	25.0	29.6	35.7

Good insulation

Ambient temp	How Well House is Sealed			
	Very Poor	Poor	Average	Good
-5°C	11.4	13.7	17.1	22.0
0	12.5	15.0	18.5	23.6
5	13.9	16.5	20.2	25.2
10	15.6	18.4	22.3	27.6
15	17.8	20.8	24.7	30.2
>20°C	22.2	25.9	30.7	37.2

HOW TO CALCULATE TOTAL ACTUAL HEAT REQUIREMENT, SUPPLEMENTARY HEAT REQUIREMENT AND NUMBER OF HEATERS REQUIRED

Step 1 – Calculate total actual heat requirement

1. Determine the conversion factor to be used from the tables above. The filed report will help you determine how well insulated the house is, the number of air changes per hour (how well sealed the shed is) and the ambient temperature. If you are in any doubt about the condition of the house etc. err on the side of caution by using a conversion factor that assumes a less well sealed / insulated house. The ambient temperature shown on the field report should be **rounded down** to the nearest value in the tables above.
2. Having established the appropriate conversion factor the actual heat required should be established using that conversion factor and the volume of the house.

Example 1 - for a house of less than 10,000m³ with average insulation, poorly sealed and at an ambient temperature of 21.5°C:

House length	= 70m
House width	= 15m
House Height	= 4m
House volume (area x 4)	= 4200m ³
Conversion factor	= 21
Heat requirement = 4200 divided by 21	= 200 kW

Step 1 – Calculate total supplementary heat requirement

3. From field report determine total heat input from heaters installed in house. If the field report indicates that the thermostatic controls for the house heaters cannot be overridden or set to at least 40°C, the heat input from the house heaters should be assumed to be zero (this is because the house heaters will switch off once their maximum operating temperature is reached e.g. 30°C and cannot then be relied on to further increase temperatures inside the house).
4. Once the contribution from the house heaters has been established the level of supplementary heat required can be calculated. This is the difference between the total house heater output and the total heat requirement calculated at step 1 above.

Example 2 - for a house with two house heaters rated at 40 Kw where thermostatic control can be overridden:

House heater output	= 40Kw
Number of house heaters	= 2

Total House Heater output (2 x 40)	= 80 Kw
Total Heat requirement (from Step 1)	= 200 kW
Supplementary Heat requirement (200 - 80)	= 120 kW

Step 3 - Calculate number of supplementary heaters required

5. Taking the supplementary heat requirement calculated at Step 2 above, the number of individual portable heater units required needs to be worked out. This will depend on the overall length of the house.

6. The basic requirement is:

- One heater within 5m (15ft) of each end-wall
- Minimum: 1 x heater per 20m (67ft) of house length, between end-wall heaters

7. The following formula should be used to calculate the minimum number of supplementary heaters required to ensure even heat distribution throughout the shed:

$$1 + ((\text{Shed length (m)} - 10) / 20)$$

Where this calculation does not give a whole number the result should be rounded up to the nearest whole number.

Example 3 – Number of supplementary heaters required for a house that is 70m long.

House length	= 70m
Number of supplementary heaters	$(1+(70 - 10) / 20) = 4$

Step 4 - Calculate minimum supplementary heater capacity required

8. The minimum supplementary heater capacity is determined by dividing the supplementary heat requirement calculated at Step 2 by the number of supplementary heaters required at step 3.

Example 4 – Minimum supplementary heater capacity required for a house that is 70m long and the characteristics described at Step 1.

Supplementary heat requirement	= 120 Kw
Number of supplementary heaters	= 4
Minimum supplementary heater capacity (120 / 4)	= 30 Kw

Note: Where the choice of heaters is limited the same number of higher capacity heater units should be used. Alternatively more lower output heaters units could be used so long as their total capacity (i.e. maximum heater capacity x number used) exceeds the supplementary heat requirement. It is

better to have overcapacity and in no case should under capacity be considered acceptable.

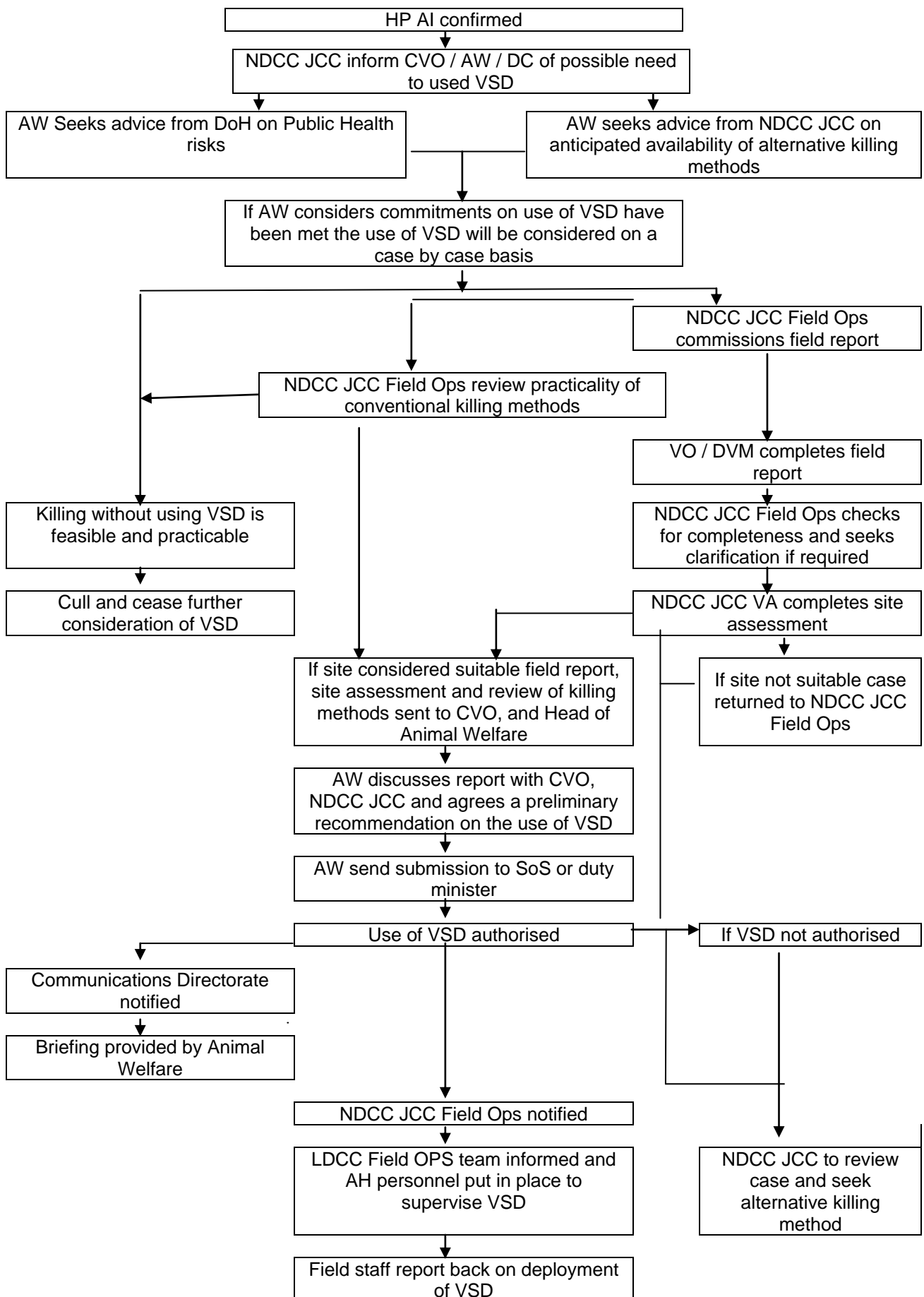
Worked example

9. The following is a worked example of a table that draws together all the steps described above. This table could be used as a guide when calculating heat requirements (and numbers of heaters required).

All the figures used are metric.

DIMENSIONS		
Width		18.3 m
Length		61 m
House height		4m
Est. house volume m ³ (length x width x height)	18.3 x 61 x 4	4,460 m³
How well house sealed		Poor
Insulation standard		Average
Ambient temp (°C)		10° C
Conversion factor	from Table	15.2
TOTAL HEAT REQUIREMENT		
Heat required (= volume divided by conversion factor)	4,460 / 15.2	293 kW
SUPPLEMENTARY HEAT REQUIREMENT		
House heater thermostats can be set to 40°C or overridden		Yes
Number of house heaters		2
House heater capacity		30 Kw
Maximum house heater output	30 x 2	60 Kw
Supplementary heat required	293 – 60	233 Kw
DISTRIBUTION OF HEATERS		
Number of end wall heaters required		2
Distance between outlying heaters and end wall (m)		5 m
Remaining length (house length minus 2 x 5 m)	61 - 10	51 m
Number of intermediate heaters along house (need to be no more than every 20 m)	(51 / 20) - 1	1.6
Total heaters based on distribution	1.6 + 2	3.6
Total heaters rounded up to nearest whole number		4
MINIMUM HEATER OUTPUT		
Supplementary heat required / minimum number of heaters	233 / 4	59 Kw
ANCILLARIES		
Heaters per generator (3 kVA)		2
Generators required	4 / 2	2
Control Unit (as specified in Section 2)		1
Zones (@ 1 per 30m)	61 / 30	2
Probes (@ 1 per zone)	2 x 1	2

VSD DECISION TREE



OUTLINE SUBMISSION SEEKING APPROVAL TO USE VENTILATION SHUTDOWN (VSD)

**AI OUTBREAK - AUTHORITY TO USE VENTILATION SHUTDOWN (VSD)
AT [.....SITE.....] IN HOUSES [.....]**

From:

Division: Animal Welfare

Location: Area 8b Millbank

Tel:

To: Secretary of State / Duty
Minister
cc List at end

Issue

1. Authority to use Ventilation Shutdown (VSD) to kill poultry at [... site....] for disease control purposes as required under Schedule 9, paragraph 6 (2) of the Welfare of Animals (Slaughter or Killing) Regulations 1995 as amended.

Recommendation

2. That you authorise the use of VSD.

Timing

3. Very urgent.

Background

4. The Avian Influenza and Influenza of Avian Origin in Mammals (England) Order 2006, which implements EC Directive 2005/94/EC, requires that birds confirmed to have avian influenza must be culled to contain the disease and cannot simply be left to die.

5. Schedule 9 of The Welfare of Animals (Slaughter or Killing) Regulations 1995 (WASK) states that no person shall kill birds using VSD except on the written authority of the Secretary of State. In addition the SoS must be satisfied that, in the individual circumstances, no other approved method of killing is practicable.

6. Ministers gave a commitment to Parliament that VSD would only contemplate the use of VSD as a last resort where:

- there is a serious and heightened concern over human and animal health; and
- there is advice that an unacceptable threat to public health exists; and
- our resources are stretched beyond capacity as a result of multiple outbreaks or insufficient catchers are available to catch birds

Public health risk

7. Describe public health risk and concerns expressed. The views expressed by the Department of Health should be included.

Veterinary assessment

- 8. Describe site, number and type of birds to be killed.
- 9. Summarise other killing methods considered
- 10. Explain why no other killing method listed at Schedule 9 to WASK is practicable
- 11. Confirm suitability of site for effective VSD on a house by house basis and any special requirements e.g. supplementary heaters.

Handling

12. Include handling line as appropriate.

Conclusions

13. We are obliged to cull diseased poultry. We are also obliged to protect public health as far as possible. As there is a serious concern about public health and there are no alternative that we can use in this case, VSD should be authorised.

Authorisation

I am satisfied that there is a potentially serious risk to public health if the birds at [.....site.....] are not killed immediately.

I am satisfied that it is impracticable to use any of the other killing methods listed in Schedule 9 to the Welfare of animals (Slaughter or Killing) Regulations 1995 as amended to kill poultry for disease control purposes at [.....site.....].

In view of this I authorise the use of Ventilation Shutdown to kill poultry for disease control purposes in houses [.....] at [.....site.....] subject to [.....insert any special requirements on a house by house basis e.g. supplementary heaters.....]

Signed: [By / On behalf of the Secretary Of State]

Print Name:

Date:

Signed Authorisation to be returned to Animal Welfare as Soon As Possible

Distribution

cc	Private Offices	Head of FFG	CVO
	Special Advisers	DG	Deputy CVO
	Head of AW	Legal adviser	AW Vet Consultant
	Dept Head of AW	CD	NDCC JCC Field Ops