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Document 2



**Australian Government**  
**Department of Defence**

Objective ID: BM7147176

s47F

Naval Group S.A  
 40-42 Rue du Docteur Finlay  
 75015 FRANCE  
 FRANCE

Dear s47F,

**SEA 1000 FUTURE SUBMARINE PROGRAM – SUBMARINE DESIGN CONTRACT —  
 DRAFT TOT WAY FORWARD REVIEW OPTIONS REPORT – COMMONWEALTH  
 RESPONSE**

**References:**


- A. Naval Group Submarine Design Contract Deliverable Data Item – DID-TOT-TWFOR (TOT-130) – DRAFT Transfer of Technology Way Forward Options Report, received 1 July 2019, (Objective ID: BM7098624).
  - B. Commonwealth Letter titled “SEA1000 Future Submarine Program – Design and Mobilisation Contract – Location and Organisation of Detailed Design Activities – Commonwealth Decision – Selection of Option 2” dated 18 December 2018 (Objective ID: BM2066191).
  - C. Commonwealth Letter titled “SEA1000 Future Submarine Program – Design and Mobilisation Contract – Integrated Master Schedule (MGT-110) – Planning Guidance” dated 3 October 2018 (Objective ID: (BJ1600343).
  - D. Commonwealth Letter titled “SEA1000 Future Submarine Program – Design and Mobilisation Contract – SDC Offer and Detailed Design Location” dated 31 December 2018 (Objective ID: BM2469740).
  - E. Commonwealth Letter titled “SEA1000 Future Submarine Contract – Transfer of Technology Way Forward Options Report” dated 18 June 2019 (Objective ID: BM6491525).
  - F. Minutes of Meeting – Intermediate Way Forward Review dated 27 June 2019, (Objective ID: BM7089977).
1. The Commonwealth acknowledges receipt of the Draft Transfer of Technology (ToT) Way Forward Review Options Report (TWFOR) (TOT-130) (Reference A). s47, s47C, s47G  
 s47, s47C, s47G

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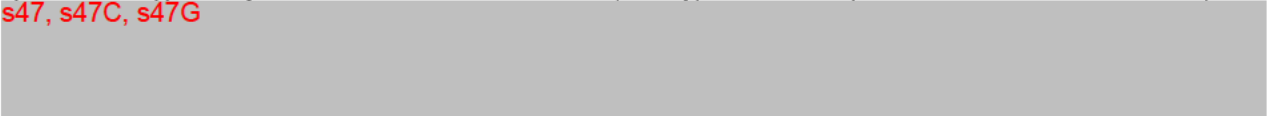
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- 2 -


2. The Commonwealth has previously expressed its decision for all of s47, s47C, s47G along with the reasons why, on numerous occasions and References B-E provide a sample set of those communications. At Reference E s47, s47C, s47G



3. The Minutes of Meeting (Reference F) refer to the specific actions necessary to move forward in preparation for the planned decision meeting (the 'ToT Way Forward Review' (TOTWFR)) in September 2019. These actions, along with the requirements within this letter, are s47, s47C, s47G



4. If you have any further questions, the Commonwealth point of contact is s47F



Yours sincerely,

s22

**C.D. BOURKE**

Commodore, Royal Australian Navy  
Director General Future Submarine Program  
Capability Acquisition and Sustainment Group

Future Submarine Program Office  
PO Box 169,  
Kilburn North SA 5084

s47F

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- 3 -

**For Information:**

s47F

Naval Group SA  
40-42 Rue du Docteur Finlay  
75015 Paris, FRANCE

s47F

Naval Group SA  
40-42 Rue du Docteur Finlay  
75015 Paris, FRANCE

Mr John Davis  
Naval Group Australia  
1 Richmond Road,  
Kewswick, Australia 5035

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s47F

**From:**  
**Sent:**  
**To:**  
**Cc:**  
**Subject:**

s47F

s47F

RE: Action From Intermediate Way Forward Review [SEC=UNCLASSIFIED]

s47F

Sorry to be late in my answer. This question raised during the intermediate WFR when we mentioned that we had currently no reliable data regarding the available workforce in Australia, experienced in detailed design activities. As well as we have no precise idea about the progress of actions that are undertaken by NSC with the RTOs in that field of competency.

Regards



s47F

AFS - ToT Delivery Manager

Cherbourg

s47F

[www.naval-group.com](http://www.naval-group.com)

s47F

Date : 11/07/2019 04:40  
Objet : Action From Intermediate Way Forward Review [SEC=UNCLASSIFIED]

**UNCLASSIFIED**

s47F

As part of the Minutes from the Intermediate Way Forward Review I have an action to facilitate access to NSC data on Sustainable Workforce.

I am wondering if you can provide me with some direction as to what exactly you need from the NSC as I have a meeting with them and the Naval Shipbuilding Office (The NSC Contract Manager) tomorrow.

Outside of the action if there is anything else I can help with please feel free to ask myself or anyone in my team.

Regards

s47F



Manager – Transfer of Technology  
 Industry Group  
 Future Submarine Program  
 s47F

**Australian Department of Defence** | Capability Acquisition and Sustainment Group

*‘The Future Submarine Program aims to deliver Australia a regionally superior submarine capability, which will be built, operated and sustained with sovereignty. The program therefore seeks to ensure that the Australian industrial capability necessary to support the build, operations and sustainment of the Future Submarine is established. This will involve maximising the involvement of Australian industry in all phases of the Program without unduly compromising capability, cost or schedule.’*

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Document 4



**Australian Government**  
**Department of Defence**

Objective ID: BM8539960

s47F

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 75015 Paris,  
 FRANCE

s47F

**SEA 1000 FUTURE SUBMARINE PROGRAM – SUBMARINE DESIGN  
 CONTRACT – CONTRACT CHANGE PROPOSAL REQUEST FOR CORE WORK  
 SCOPE 1 (CWS1) – TRANSFER OF TECHNOLOGY WAY FORWARD REVIEW  
 CCP**

**References:**

- A. Minutes of Meeting – Intermediate Way Forward Review, dated 27 June 2019, (Objective ID: BM7089977)
- B. Naval Group Submarine Design Contract Deliverable Data Item - DID-TOT-TWFOR (TOT-130) - DRAFT Transfer of Technology Way Forward Options Report, received 1 July 2019, (Objective ID: BM7098624)
- C. SEA1000 Future Submarine Program - Submarine Design Contract (Contract No. CASG/FSP/Con9044/2), between the Commonwealth and Naval Group SA, dated 1 March 2019 (Objective ID: fAB5458026) (**Submarine Design Contract**)
- D. Commonwealth Letter titled “SEA1000 Future Submarine Program – Submarine Design Contract– Draft ToT Way Forward Review Options Report – Commonwealth Response” dated 8 July 2019 (Objective ID: BM7147176)
- E. Commonwealth Letter titled “CCP Request for CWS1 (ICT, PMO Costs & Infrastructure)” dated 13 August 2019 (Objective ID: BM8431794)

1. At the Intermediate ToT WFR meeting on 27 June 2019, Naval Group requested the Commonwealth to confirm the Contract Change Proposal (CCP) input requirement for the Transfer of Technology Way Forward Review (TOT WFR), as captured in Action Item 4 of the Minutes of Meeting (at Reference A).

2. In response Action Item 4 of Reference A, the Commonwealth requests Naval Group to deliver a CCP to s47, s47C  
 s47, s47C

which will enable the Commonwealth to undertake an informed value for money assessment. The Commonwealth understands that this analysis will be delivered through submission of the Final TWFOR and later presented at the TOT WFR, s47

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s47

4. The Commonwealth acknowledges that at References A and B, Naval Group have stated that s47, s47C

s47, s47C

s47, s47C

e. provide all necessary information to satisfy Naval Group's remaining actions, at Reference A (including but not limited to providing an assessment of the current Australian arranger workforce across the Naval Group "SAME" skill categorisation system).

6. Naval Group is advised that should it notify the Commonwealth, as described in paragraph 2, this s47, s47C As a

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result the Parties will need to work collaboratively to minimise any consequent impacts to the Contract and Program schedule.

7. Naval Group is to ensure that the CCP addresses the Commonwealth's requirements in relation to the changes requested above in accordance with Enclosure 1 and that the

s47

detailed Price and Delivery schedule, with applicable risks captured in the Risk Register (MGT-420).

8. The Commonwealth requests that this CCP be provided by the 6<sup>th</sup> of September 2019. For clarity, this CCP will be separate to the combined CCP requested by the Commonwealth at Reference E.

9. If you have any questions, the Commonwealth point of contact is s47F

Yours sincerely

s22

**C.D. BOURKE**

Commodore, Royal Australian Navy  
Director General Future Submarine Program  
Capability Acquisition and Sustainment Group  
Future Submarine Program Office  
PO Box 169,  
Kilburn North SA 5084

s47F

14 August 2019

**Enclosure:**

1. Requested CCP proposal – Combined CCP to the Submarine Design Contract

**For information:**

s47F

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s47F

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Mr John Davis  
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s47F

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**Enclosure 1 to  
BM8539960**

s47C, s47G



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s47C, s47G



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Document 5



**Australian Government**  
**Department of Defence**

Objective ID: BM7751131

s47F

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s47F

**SEA 1000 FUTURE SUBMARINE PROGRAM – SUBMARINE DESIGN CONTRACT  
– DELIVERABLES RESPONSE - TOT-130 - TOT WAY FORWARD OPTIONS  
REPORT - FINAL VERSION**

**References:**

- A. Commonwealth Letter titled “SEA1000 Future Submarine Program – Submarine Design Contract– Transfer of Technology – Way forward Review – Mandated System Review – Delay” dated 13 September 2019 (Objective ID: BM9423690)
- B. SDC Deliverable Data Item – TOT-130 - ToT Way Forward Options Report - Final version, received 3 September 2019.
- C. SEA1000 Future Submarine Program - Submarine Design Contract (Contract No. CASG/FSP/Con9044/2), between the Commonwealth and Naval Group SA, dated 1 March 2019 (Submarine Design Contract). (Objective ID: BM485579)
- D. Commonwealth Letter titled “SEA1000 Future Submarine Program – Submarine Design Contract– Contract Change Proposal Request for Core Work Scope 1 (CWS1) – Transfer of Technology Way forward Review CCP” dated 14 July 2019 (Objective ID: BM8539960)

1. As per advice provided at Reference A, the Commonwealth informed Naval Group that accordance with clauses 2.1.1.2 and 2.4 of the Submarine Design Contract (SDC) Statement of Work (SOW), the status of the deliverable ToT-130 Transfer of Technology Way Forward Report (Reference B) is:

Deliverable Data Item	Status
TOT-130 - ToT Way Forward Options Report Final version	s47C, s47G

2.

s47C, s47G

s47C, s47G

3. As part of the review of Reference B, the Commonwealth provides Naval Group with comments as detailed at Enclosure 1.

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- 2 -

4. The point of contact for this deliverable is s47F

Yours sincerely,

s22



**C.D. BOURKE**

Commodore, Royal Australian Navy  
Director General Future Submarine Program  
Capability Acquisition and Sustainment Group

Future Submarine Program  
PO Box 169  
Kilburn North SA 5084

s47F

16 October 2019

**Enclosure:**

1. Commonwealth comments against TOT-130 - ToT Way Forward Options Report - Final version, dated 17 September 2019.

**For Information:**

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s47F

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Keswick, Australia 5035

Mr John Davis  
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Keswick, Australia 5035

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## Future Submarine Program

### Deliverable Data Item Review Comments

<b>CDRL Document Title</b>	TOT-130 - ToT Way Forward Options Report (TWFOR)	<b>Objective ID (of PDF Deliverable)</b>	BM9148248
<b>CDRL Version Information</b>	Final version – ToT WFR-20 (CDRL Ref b) - Revision B	<b>Date Received / Registered</b>	3 September 2019
<b>CoA Action required</b>	<input type="checkbox"/> Review <input checked="" type="checkbox"/> Approval <input type="checkbox"/> Non Official Deliverable (NOD)	<b>Total Review Period (e.g. Working Days (WDs))</b>	20 Working Days
<b>Review Lead</b>	s47F	<b>Final Stream Review Date</b>	27 September 2019
<b>Control Account / Director Approver</b>	s47F	<b>Commonwealth Approval Timeframe (DGFSP)</b>	2 Working Days
<b>Overall Rating / Comments</b>	s47C, s47G	<b>Final Date for Reply (to be sent to NG/LMA)</b>	1 October 2019

s47, s47C, s47G

Priority <sup>2</sup>	Total Number of Priority Comments
1 <b>Highest priority</b> - must be addressed. Has the potential to provide incorrect direction or guidance.	s47C, s47G
2 <b>Medium priority</b> - should be addressed in future updates. If left document may not be incorrect but may be ambiguous.	
0 <b>Observation</b> - Typical of typographical and grammatical errors. Should only be addressed when a future update is required or other higher priority comments are being addressed.	

Objective ID: BM7751132

Page 1 of 19

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s47, s47C, s47G



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s47, s47C, s47G



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s47, s47C, s47G



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s47, s47C, s47G



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s47, s47C, s47G



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Document 6



**Australian Government**  
**Department of Defence**

Objective ID: BM9354397

s47F

Naval Group S.A.  
 40-42 Rue du Docteur Finlay  
 75015 Paris,  
 FRANCE

s47F

**SEA 1000 FUTURE SUBMARINE PROGRAM – SUBMARINE DESIGN  
 CONTRACT – TRANSFER OF TECHNOLOGY – WAY FORWARD REVIEW –  
 MANDATED SYSTEM REVIEW - DELAY**

**References:**

- A. Naval Group Submarine Design Contract Deliverable Data Item - DID-TOT-TWFOR (TOT-130) - FINAL Transfer of Technology Way Forward Options Report, received 3 September 2019, (Objective ID: BM9146483).
- B. Commonwealth Letter titled “SEA1000 Future Submarine Program Submarine Design Contract Contract Change Proposal Request for Core Work Scope 1 (CWS1) – Transfer of Technology Way forward Review CCP” dated 14 July 2019 (Objective ID: BM8539960)
- C. SEA1000 Future Submarine Program - Submarine Design Contract (Contract No. CASG/FSP/Con9044/2), between the Commonwealth and Naval Group SA, dated 1 March 2019 (**Submarine Design Contract**). (Objective ID: BM485579).
- D. Naval Group Letter titled “Australian Future Submarine Program Submarine Design Contract – Contractor ToT Offer”, dated 6 September 2019, Naval Group Reference (COR-2019-703727), Commonwealth Reference (Objective ID: BM9273894)

1. The Commonwealth acknowledges the delivery of ToT-130 Transfer of Technology Way Forward Report (Reference A). The Commonwealth advises that in accordance with clauses 2.1.1.2 and 2.4 of the Submarine Design Contract (SDC) Statement of Work (SOW), the the s47C, s47G

2. s47C, s47G

s47C, s47G

3. The Commonwealth has reviewed Reference A and confirms that it s47C, s47G

s47C, s47G

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s47C, s47G



6. If you have any questions, the Commonwealth point of contact is s47F  
who can be contacted via s47F

Yours sincerely

s47F



for

**C.D. BOURKE**

Commodore, Royal Australian Navy  
Director General Future Submarine Program  
Capability Acquisition and Sustainment Group

Future Submarine Program Office  
PO Box 169,  
Kilburn North SA 5084

s47F



13 September 2019

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~~FOR OFFICIAL USE ONLY~~**For information:****s47F**

Naval Group S. A.  
40-42 Rue du Docteur Finlay  
75015 Paris,  
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**s47F**

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Mr John Davis  
Naval Group Australia  
1 Richmond road  
Keswick, 5035  
AUSTRALIA

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s22



s22





s22

s47F

Sent: Thursday, 14 November 2019 8:36 PM

s47F

**Subject:** RE: Invitation : Next steps from last Friday's discussion on ToT Detailed Design (DD) and Design Authority (DA) (13 Nov 14:00 CET) [SEC=UNCLASSIFIED]

**UNCLASSIFIED**

Thank you s47F

I'm adding other interested parties to the distribution for awareness.

We will receive and consider your letter. Just as a reminder from our discussions yesterday, we will be looking for in the content of your extension request the elements/aspects of the ToT 130 report you plan on strengthening through the extension period. In the end we are seeking an ability to move forward and get to the ToT Way Forward Review (meeting all entrance requirements) taking full advantage of the discussions we have been having in recent weeks which in the ideal will synchronise us. The importance of having a matched view on the way forward on this exceptionally important topic cannot be overstated.

I look forward to your next suggested meeting time (hopefully soon) so we can continue making progress.

Thanks and best regards,

s47F

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s47F

**Sent:** Thursday, November 14, 2019 10:49 AM

s47F

**Subject:** RE: Invitation : Next steps from last Friday's discussion on ToT Detailed Design (DD) and Design Authority (DA) (13 Nov 14:00 CET) [SEC=UNCLASSIFIED]

s47F

Thank you for your time yesterday, we had another interesting discussions.

Following the meetings held since the end of October regarding the update of the ToT-130, NG is requesting to the CoA that the revised ToT-130 be delivered on the **December 20th**

Naval Group will send a letter today to ask for this extension.

We understood that the purpose of this email was also to propose the next meeting, we will come back to you on this point as soon as possible because we need further internal discussions.

Regards

s47F

AFS - ToT Delivery Manager

Cherbourg

s47F

[www.naval-group.com](http://www.naval-group.com)

s47F

Date : 13/11/2019 09:08

Objet : RE: Invitation : Next steps from last Friday's discussion on ToT Detailed Design (DD) and Design Authority (DA) (13 Nov 14:00 CET) [SEC=UNCLASSIFIED]

s22

s22



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s47F

**From:** s47F  
**Sent:** Monday, 6 January 2020 1:59 PM  
**To:** s47F  
**Subject:** FW: TOT WFOR [SEC=UNCLASSIFIED]

UNCLASSIFIED

s47F

Director – Australian Industry  
 Future Submarine Program

s47F

---

**Australian Department of Defence** | Capability Acquisition and Sustainment Group

s47F

*'The Future Submarine Program aims to deliver Australia a regionally superior submarine capability, which will be built, operated and sustained with sovereignty. The program therefore seeks to ensure that the Australian industrial capability necessary to support the build, operations and sustainment of the Future Submarine is established. This will involve maximising the involvement of Australian industry in all phases of the Program without unduly compromising capability, cost or schedule'.*

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s47F

**Sent:** Thursday, 24 October 2019 12:48 AM

s47F

**Subject:** TOT WFOR

s47F

Further to our call today, and further to the discussion which took place also today between s47F, I can confirm you the VTC on Tuesday Oct 29th from 8:00 to 9:00 French time ( 5:30 pm to 6:30 pm Adelaide time) between Cherbourg and Adelaide on the topic of TOT WFOR.

As we discussed, the objective of this meeting will be

1 - To agree on the answer that Naval Group will send responding to CoA's comment sheet on TOT 130. The objective is to be able to send you an official letter which will be acceptable by the CoA so that the CoA agrees to hold formally the TOT Way Forward Review.

I plan to send through GovTeam by end of this week a draft of comment sheet with our comments on the items noted

1

During the VTC we would have to focus only on the most critical items.

2 - To agree on the principle s47, s47C which could be shared at the TOT Way Forward Review

3 - To agree on sequencing and scheduling of TOT WFOR review and associated CCP

I send an invitation for this VTC meeting

s47F

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Document 10



**Australian Government**  
**Department of Defence**

Objective ID: BM10298509

s47F

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FRANCE

s47F

**SEA1000 FUTURE SUBMARINE PROGRAM – SUBMARINE DESIGN CONTRACT  
- RESPONSE TO LETTER TITLED AUSTRALIAN FUTURE SUBMARINE  
PROGRAM TOT WAY FORWARD**

**References:**

- A. Naval Group letter titled “Australian Future Submarine Program ToT Way Forward”, dated 18 October 2019, (COR-2019-704485), (Objective ID: BM10256677)
- B. Commonwealth letter titled “SEA1000 Future Submarine Program – Submarine Design Contract – Transfer of Technology – Way Forward Review – Mandated System Review – Delay”, dated 13 September 2019, (Objective ID: BM9423690)
- C. SEA1000 Future Submarine Program – Submarine Design Contract (Contract No. CASG/SD/Con9044/2), between the Commonwealth and Naval Group SA, dated 1 March 2019 (Objective ID: fAB5458026) (**Submarine Design Contract**)
- D. Commonwealth Letter titled “SEA1000 Future Submarine Program – Submarine Design Contract – Deliverables Response – TOT-130 – TOT Way Forward Options Report – Final Version”, dated 16 October 2019 (Objective ID: BM7751131)
- E. Commonwealth Letter titled “SEA1000 Future Submarine Program – Submarine Design Contract – Contract Change Proposal Request for Core Work Scope 1 (CWS1) – Transfer of Technology Way forward Review CCP” dated 14 July 2019 (Objective ID: BM8539960)

1. Thank-you for your letter at Reference A which requests agreement to the Naval Group proposed way forward for Detailed Design and Design Authority for Sustainment. s47, s47C, s47G  
s47, s47C, s47G

2. As advised at Reference B and in accordance with Reference C, s47, s47C, s47G  
s47, s47C, s47G

3. The Commonwealth reiterates its decision at Reference D s47, s47C, s47G  
s47, s47C, s47G

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4. At Reference A, Naval Group suggested that agreement to the Contract Change Proposal (CCP) for the ToT WFR is necessary to avoid a significant impact to the Australian engineers currently working in France. During the February SDC negotiations the Commonwealth agreed to fund the Australian engineers sent to France before 31 December 2019 for the period of CWS1 and this is included in the SDC Statement of Work. The Commonwealth remains committed to funding these costs.

s47, s47G

6. In relation to the ICT services, the Commonwealth understands Naval Group's position and is willing to work together to resolve the matter as a matter of priority should

s47, s47C, s47G

7. s47, s47C, s47G

s47, s47C, s47G

s47, s47C, s47G

Accordingly, the Commonwealth remains willing to provide further clarification and assistance to Naval Group as may be required. Furthermore, it is understood that this issue will be considered by the relevant bilateral governance committee as agreed within in the Strategic Partnering Agreement (SPA) in the near future.

8. If you have any questions, the Commonwealth point of contact is s47F

@

Yours sincerely,

s22


**C.D. BOURKE**

Commodore, Royal Australian Navy  
Director General Future Submarine Program  
Capability Acquisition and Sustainment Group

Future Submarine Program Office  
PO Box 169,  
Kilburn North SA 5084

s47F

29 October 2019

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~~For Official Use Only~~**For Information:****s47F**

Naval Group SA  
40-42 Rue du Docteur Finlay  
75015 Paris, FRANCE

**s47F**

Naval Group SA  
40-42 Rue du Docteur Finlay  
75015 Paris, FRANCE  
Mr Gerard Autret  
Naval Group Australia  
1 Richmond Road,  
Keswick, Australia 5035

**s47F**

Naval Group Australia  
1 Richmond Road,  
Keswick, Australia 5035

Mr John Davis  
Naval Group Australia  
1 Richmond Road,  
Keswick, Australia 5035

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s47F

---

**From:** s47F  
**Sent:** Monday, 6 January 2020 1:59 PM  
**To:** s47F  
**Subject:** FW: Tr : RE: Tr : TOT WFOR - answer to CoA's comment sheet [SEC=UNCLASSIFIED]  
**Attachments:** ToT-130 - Draft answer to comment sheet V2.docx

UNCLASSIFIED

*Best regards,*

s47F

s47F

Director – Australian Industry  
 Future Submarine Program

s47F

---

**Australian Department of Defence | Capability Acquisition and Sustainment Group**

s47F

*'The Future Submarine Program aims to deliver Australia a regionally superior submarine capability, which will be built, operated and sustained with sovereignty. The program therefore seeks to ensure that the Australian industrial capability necessary to support the build, operations and sustainment of the Future Submarine is established. This will involve maximising the involvement of Australian industry in all phases of the Program without unduly compromising capability, cost or schedule'.*

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**From:** s47F  
**Sent:** Saturday, 26 October 2019 3:46 AM  
**To:** s47F  
**Subject:** Tr : RE: Tr : TOT WFOR - answer to CoA's comment sheet [SEC=UNCLASSIFIED]

Hi s47F

A first draft of answer to CoA's comment sheet has been sent s47F

s47F and him have planned a conf call on Monday to have a first analysis so that at our VTC on next Tuesday we can only focus on the main points.

Best regards

s47F

----- s47F -----

De : s47F

A :

Cc :

s47F

Date : 25/10/2019 18:49  
Objet : RE: Tr : TOT WFOR - answer to CoA's comment sheet [SEC=UNCLASSIFIED]

---

Hi s47F

Please find our draft comment sheet answer that has to be analysed during our meeting on Monday. I will join you at 17:00 (7:30 in France)

Regards



s47F  
AFS - ToT Delivery Manager

Cherbourg

s47F

[www.naval-group.com](http://www.naval-group.com)

De : s47F  
A :  
Cc :  
s47F  
Date : 24/10/2019 00:26  
Objet : RE: Tr : TOT WFOR - answer to CoA's comment sheet [SEC=UNCLASSIFIED]

---

UNCLASSIFIED

s47F this sounds like a good idea so I will work with s47F today and sort out.

Regards

s47F  
Manager – Transfer of Technology  
Industry Group  
Future Submarine Program  
s47F

---

**Australian Department of Defence** | Capability Acquisition and Sustainment Group

s47F

*'The Future Submarine Program aims to deliver Australia a regionally superior submarine capability, which will be built, operated and sustained with sovereignty. The program therefore seeks to ensure that the Australian industrial capability necessary to support the build, operations and sustainment of the Future*

*Submarine is established. This will involve maximising the involvement of Australian industry in all phases of the Program without unduly compromising capability, cost or schedule.'*

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**From:** s47F  
**Sent:** Thursday, 24 October 2019 1:59 AM  
**To:** s47F  
**Cc:** s47F  
**Subject:** Tr : TOT WFOR - answer to CoA's comment sheet

Hi s47F

Following this invitation (issued from a discussion between s47F) I asked s47F to be in touch with you to book a VTC either in Dudley or in Keswick, as you prefer.

s47F suggested also to have a preliminary VTC on Monday to identify between us on which topic we should agree on the basis of our proposal and those on which we will have to focus on Monday. Are you OK ?

Regards



s47F  
 AFS - ToT Delivery Manager

Cherbourg

s47F

[www.naval-group.com](http://www.naval-group.com)

s47F



**TOT WFOR - answer to CoA's comment sheet**

**mar. 29/10/2019 8:00 - 9:00**

La participation est pour s47F

Organisateur :

s47F

Aucune information sur l'emplacement

Requis :

s47F

s47F

please book rooms and arrange a VTC between Cherbourg and Adelaide

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S47, S47C, S47G



S47, S47C, S47G





S47, S47C, S47G



S47, S47C, S47G



S47, S47C, S47G



S47, S47C, S47G



S47, S47C, S47G



S47, S47C, S47G



S47, S47C, S47G



S47, S47C, S47G





S47, S47C, S47G



S47, S47C, S47G



s47F

**From:** s47F  
**Sent:** Monday, 6 January 2020 2:01 PM  
**To:** s47F  
**Subject:** FW: Tr : TOT WFOR [DLM-SENSITIVE]  
**Attachments:** ToT-130 - Draft answer to comment sheet V2.docx

~~Sensitive~~

s47F

Director – Australian Industry  
 Future Submarine Program

s47F

Australian Department of Defence | Capability Acquisition and Sustainment Group

s47F

*'The Future Submarine Program aims to deliver Australia a regionally superior submarine capability, which will be built, operated and sustained with sovereignty. The program therefore seeks to ensure that the Australian industrial capability necessary to support the build, operations and sustainment of the Future Submarine is established. This will involve maximising the involvement of Australian industry in all phases of the Program without unduly compromising capability, cost or schedule'.*

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s47F

**Sent:** Monday, 28 October 2019 8:02 PM

s47F

**Subject:** Tr : TOT WFOR

s47F

I confirm our meeting through VTC which will take place tomorrow from 5:30 pm to 6:30 pm Adelaide time ( 8:00 to 9:00 French time)  
 Room DP 1L- Conf Rm 3 in Dudley Park  
 Room Melbourne in Cherbourg HH

As support for item 1 of the meeting, please find attached the draft answer to CoA's Comment Sheet

Further to the preliminary meeting which took place today with s47F appears that we will have to treat in

priority during the meeting our answers to the items 1, 5, 9, 10 and 11 of the Comment Sheet.

Best regards

s47F

s47F

s47F

Date : 23/10/2019 16:18  
Objet : TOT WFOR

s47F

Further to our call today, and further to the discussion which took place also today between s47F I can confirm you the VTC on Tuesday Oct 29th from 8:00 to 9:00 French time ( 5:30 pm to 6:30 pm Adelaide time) between Cherbourg and Adelaide on the topic of TOT WFOR.

As we discussed, the objective of this meeting will be

1 - To agree on the answer that Naval Group will send responding to CoA's comment sheet on TOT 130. The objective is to be able to send you an official letter which will be acceptable by the CoA so that the CoA agrees to hold formally the TOT Way Forward Review. I plan to send through GovTeam by end of this week a draft of comment sheet with our comments on the items noted 1 During the VTC we would have to focus only on the most critical items.

2 - To agree on the principle s47, s47C, s47G which could be shared at the TOT Way Forward Review

3 - To agree on sequencing and scheduling of TOT WFOR review and associated CCP

I send an invitation for this VTC meeting

s47F

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s47, s47C, s47G



s47, s47C, s47G



s47, s47C, s47G



s47, s47C, s47G





s47, s47C, s47G



s47, s47C, s47G



s47, s47C, s47G



s47, s47C, s47G



s47, s47C, s47G



s47, s47C, s47G



s47, s47C, s47G



s47, s47C, s47G





s22

s22

s47F

Sent: Wednesday, 30 October 2019 1:28 PM

s47F

Subject: ToT Way Forward Review [SEC=UNCLASSIFIED]

UNCLASSIFIED

s47F

During last night's ToT Way forward VTC discussion, it was indicated by NG that the contract requires the updated version of ToT-130 by the 15 Nov 19. This means NG is required to address the CoA comments and release the document for s47, s47C, s47G by the 9 Nov 19 (7 working days from now).

It was agreed during this discussion that there **also** needs to be a follow-on workshop to review the NG response prior to delivery to the CoA.

Given the remaining work days left to hold this workshop the CoA is open to a request from NG for an extension of time for delivery of ToT-130.

If this is the case NG is requested to formalise this request via a letter.

Regards

s47F

Deputy Mission System Director  
Future Submarine Program | SEA 1000

---

**Department of Defence** | Capability Acquisition and Sustainment Group  
Russell Offices, R2-1-A074 | CANBERRA ACT 2610

s47F

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s47F

**From:** s47F  
**Sent:** Monday, 6 January 2020 1:55 PM  
**To:** s47F  
**Subject:** FW: Follow up regarding Detailed Design workshop this week  
[SEC=UNCLASSIFIED]

UNCLASSIFIED

s47F

Director – Australian Industry  
Future Submarine Program

s47F

s47F

*'The Future Submarine Program aims to deliver Australia a regionally superior submarine capability, which will be built, operated and sustained with sovereignty. The program therefore seeks to ensure that the Australian industrial capability necessary to support the build, operations and sustainment of the Future Submarine is established. This will involve maximising the involvement of Australian industry in all phases of the Program without unduly compromising capability, cost or schedule'.*

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s47F

**Sent:** Wednesday, 6 November 2019 12:39 AM

s47F

**Subject:** RE: Follow up regarding Detailed Design workshop this week [SEC=UNCLASSIFIED]

UNCLASSIFIED

s47F

I would like the synthesis and I need to be involved in what's happening.

s47F

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s47F

**Sent:** Tuesday, November 5, 2019 3:04 PM

s47F

**Subject:** RE: Follow up regarding Detailed Design workshop this week [SEC=UNCLASSIFIED]

s47F

Thank you for your email.

Further to the meeting we had on Oct 29th, we immediately engaged some discussions with s47F to prepare this elements.

Due to the difficulties with the time difference, we have organized several workshops directly in Adelaide, involving TOT and engineering teams.

A first workshop took place today and a second one is planned on Thursday, with the attendance s47F

My understanding is that the work is progressing well in the direction you recall in your email; a holistic approach of the situation including

- the workload diagrams for E and M level experts
- the global roadmap for building Design Authority in Naval Group Australia
- the global roadmap for involving Australian Industry

I would be pleased to have the opportunity to share with you the synthesis of this work, including the storyboard of the global approach, before end of this week.

I can travel to Cherbourg and propose you a meeting on this topic on Friday morning (for instance from 10h00 to 12h00)

Dos this suit you ?

I also had exchanges s47F and I fully support the ideas they are exploring for solving the issues on CCP, which is the needed contractual complement to what we are working on the operational side

Looking forward to your feedback

s47F

s47F

Date : 05/11/2019 11:13  
Objet : Follow up regarding Detailed Design workshop this week [SEC=UNCLASSIFIED]

UNCLASSIFIED

s47F

I wanted to drop you a note asking status for scheduling the workshop regarding way forward activities on ToT (Detailed Design (DD)). s22

Recall last week on 29<sup>th</sup> October a group of us met to discuss a Naval Group proposed path forward regarding a constructive approach to DD.

An essential building block of the way forward was amongst other things the workload diagrams that were presented for M and E level experts as it related to DD design and location. I've attached what I have to refresh all on the subject.

We spoke at length regarding not only how to further develop the attached reference, but other material that should be developed and packaged to support a holistic view on the situation.

It was agreed last week that NG would work up a storyboard of the proposed approach taking in the broader view and discuss at a workshop this week. The idea being a holistic view of the path ahead, so, if we put the full measure of effort against the proposal and develop it further, we believe we could reach a satisfying outcome for us.

s22

I look forward to hearing from you and when the earliest opportunity for conducting the workshop is.

Best Regards,

s47F

Mission System Director  
Future Submarine Program | SEA 1000

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**Department of Defence** | Capability Acquisition and Sustainment Group  
Hughes House | CHERBOURG-EN-COTENTIN

s47F

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s47F

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s47F

**From:** s47F  
**Sent:** Monday, 6 January 2020 1:53 PM  
**To:** s47F  
**Subject:** FW: Next steps from last Friday's discussion on ToT Detailed Design (DD) and Design Authority (DA) [SEC=UNCLASSIFIED]

UNCLASSIFIED

s47F

Director – Australian Industry  
Future Submarine Program

s47F

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**Australian Department of Defence** | Capability Acquisition and Sustainment Group

s47F

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s47F

**Sent:** Wednesday, 13 November 2019 1:18 AM

s47F

**Subject:** RE: Next steps from last Friday's discussion on ToT Detailed Design (DD) and Design Authority (DA) [SEC=UNCLASSIFIED]

s47F

I totally share your objective to define as soon as possible a mutually agreed path to both an approved TOT130 (enabling to held the TOT WFOR) as well as to a CCP s47C, s47G activities on TOT

s47C, s47G

s22

s47F

s47F

Date : 11/11/2019 11:46

Objet : Next steps from last Friday's discussion on ToT Detailed Design (DD), Design Authority (DA) plus the sound plan for procurement and entrance criteria for SRR [SEC=UNCLASSIFIED]

## UNCLASSIFIED

s22

s47F

Thanks for your time and that of s47F Friday. I believe we settled on a follow up mid this week where s47F to develop our discussion points more fully on the storyboard side (bringing whole picture together for ToT, DD and DA). This is an important element of the foundation for a good transition plan like we discussed. There are some additional items which demand our attention as well and I'd like to factor in to our time together this week.

So we are aligned:

- Please develop more thoroughly the total workload discussion we had for Detailed Design – this connects s47, s47C I have already circulated inside the Commonwealth the output of our meeting Friday. I'm also interested for more detail on a transition plan like we discussed. I believe you were motivated, as are we, to put something together as soon as possible and in particular in light of GMSubs discussions at the 23 October Senate Estimates hearing.
- This connects with your desires to request an extension for the re-submit for ToT 130. We should talk at our next meeting this week s47C, s47G s47C, s47G Please be prepared to discuss your intentions for a proposed new due date.
- The two previous points will contribute directly to our ongoing CCP conversation s47F s47F are having in parallel. s47F at minimum to participate via telecom accordingly, s47F obviously at NG's discretion when we schedule our time.
- I'd like to be able to by the end of this week have a mutually agreed path to an approvable ToT 130, and how that path supports meeting the ToT WFR requirements which were meant for September this year. We do need to bring all of this together so we can have a proper transition plan for Detailed Design and Design Authority that can be instantiated by a CCP as previously agreed. It will be a foundation for the remaining execution period s47

s22



s22



s22



s22



s22



s22



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PRIORITY	
For information	X
Answer awaited	

Naval Group  
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Commodore Craig Bourke  
Director General Future Submarine Program  
Future Submarine Technical Office  
PO Box 169  
Kilburn North SA 5084  
Australia

s47F

Cherbourg, 30<sup>h</sup> of October 2019

**O/Ref.** : COR-2019-704677

**Y/Ref.** : [Ref1] CoA Objective ID BM77511131/BM7751132 dated 16/10/2019 -  
Letter/Comments sheet - TOT-130 - ToT Way Forward Options Report Final version -

s47, s47C, s47G

**Subject** : Australian Future Submarine Program  
ToT Way Forward Option Report (ToT-130)

**C. A.** : 03

Dear Commodore Bourke,

Following the meeting in relation to the preparation of answer to the Comment Sheet in [Ref1] held between the Parties in Cherbourg on the 29<sup>th</sup> of October 2019, Contractor has attached in Annex A its answers to the Priority 1 comments.

During the meeting mentioned above, it was decided to organize an intermediate workshop to present a "storyboard" giving more detailed information on how Contractor would respond to the points of [Ref1].

Contractor proposes to organize these workshops in week 45, with one session in Australia and one session in France.

Depending on the outcomes of these workshops, Contractor may ask for an extension of the date of delivery of updated ToT-130. In such a case, Contractor would send a dedicated letter.

Contractor remains available for any clarifications.



Dispatch note: COR-2019-704677

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Yours sincerely,

s47F

AFSP Sovereignty Director

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s47F

**Enclosures : Answers to the Priority 1 comments**

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Cherbourg, 14<sup>th</sup> of November 2019

**O/Ref.** : COR-2019-704677

**Y/Ref.** : [Ref1] CoA Objective ID BM77511131/BM7751132 dated 16/10/2019 - Letter/Comments sheet - TOT-130 - ToT Way Forward Options Report Final version - s47, s47C, s47G  
[Ref2] COR-2019-704677 - Australian Future Submarine Program - ToT Way Forward Option Report (ToT-130)

**Subject** : Australian Future Submarine Program  
ToT Way Forward Option Report (ToT-130) – Extension request for the delivery of the next revision

**C. A.** : 03

Dear Commodore Bourke,

Following the s47, s47C, s47G  
s47, s47C, s47G

Since reception of the comment sheet [Ref1], and in accordance with the Commonwealth's suggestion, Contractor has organized several meetings to present the draft answers to the priority 1 comments in order s47, s47C, s47G

Following the meetings which were held up until 13<sup>th</sup> November 2019, s47, s47C, s47G  
s47, s47C, s47G. As such, Contractor will need more time to address the overall picture of the Design Authority in the way it has been clarified by the CoA. All related back-up is detailed in the enclosure in the column "Extension justification" that has been added to the table already delivered with [Ref2]

As a result of the above, Contractor therefore requests that the date of delivery of the next revision of the ToT WFOR be modified from the 15<sup>th</sup> November to 20<sup>th</sup> of December 2019.

Dispatch note: COR-2019-704677

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Contractor looks forward to the Commonwealth's agreement to the above request and remains available for any clarifications.

Yours sincerely,

s47F

AFSP Sovereignty Director

s22

s47F

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s47, s47C, s47G



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PRIORITY	
For information	X
Answer awaited	

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Cherbourg, 19<sup>th</sup> of December 2019

**O/Ref.** : COR-2019-705583

**Y/Ref.** : [Ref 1] DOC-2019-703295 - ToT Workshop of September / October 2019 – Minutes of meeting with CoA in Adelaide  
[Ref 2] DOC-2019-704002 - ToT Workshop of December 2019 – Minutes of meeting with CoA in Adelaide

**Subject** : Australian Future Submarine Program  
Content of the next version of Transfer of Technology Plan (ToTP – TOT-120)

**C. A.** : 08

Dear Commodore Bourke,

During the ToT meeting held on 30<sup>th</sup> of September 2019 ([Ref 1] – minutes of the meeting), the contractor presented to CoA the content of the next delivery of the Transfer of Technology Plan (ToT-120). The next version will include the latest version approved of the following ToT capability plans:

s22

As stated during the ToT meeting held on 3<sup>rd</sup> of December 2019 ([Ref 2] - ToT Workshop of December 2019 – Minutes of meeting with CoA in Adelaide), the ToT Design Plan will be delivered in two parts in the next revision of the Transfer of Technology Plan (ToT-120):

s22

- ToT Detailed Design Plan.

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In the next revision, the ToT Detailed Design Plan s22 will be updated accordingly with the outcomes of the ToT WFR.

As the CDRL of the SDC CWS1 specifies, the next revision of the Transfer of Technology Plan (ToT-120) is planned to be delivered 20 working days after the conclusion of the ToT Way Forward Review (not yet scheduled).

Contractor remains available for any further questions.

Yours sincerely,

s47F

AFSP Sovereignty & Procurement Program Director

s22

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# AUSTRALIAN FUTURE SUBMARINE PROGRAM

## ToT Way Forward Options Report Final Version for Approval

This document contains Naval Group SA Background IP and Foreground



Prepared for:  
Future Submarine Project Office  
Australian Department of Defence

Prepared by:  
Naval Group  
40-42 Rue du Docteur Finlay  
75015 Paris, FRANCE

DOC-2019-701210 - C  
December 2019



Originator: Australia and France

**NAVAL**  
GROUP

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## Approval

	Name	Date	Signature
Drafted by	s47F	13/12/2019	Visa acquis
Validated by		17/12/2019	Visa acquis
Approved by		19/12/2019	Visa acquis

## Revision Index

Revision	Date	Revision Content
A	24/06/2019	Draft
B	30/08/2019	Final
C	19/12/2019	Final



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CDR ToT-130

COMMONWEALTH OF AUSTRALIA  
Submarine Design Contract

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Final  
FUTURE SUBMARINE PROGRAM  
TWFOR

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Table 34.  
Table 35.

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## 1 Executive Summary (FGD - ~~FOUO~~)

Obtaining sovereignty to operate and sustain the Attack Class Submarine (ACS) implies to correctly size and adequately train a dedicated design authority for sustainment in Australia. Therefore, the Australian Design Authority (ADA) is being developed and will have competencies to perform the following strategic objectives:

- Monitor the ACS construction;
- Master regular In Service Support (ISS); and
- Master significant evolutions implemented throughout the batches.

Contribution to the initial Detailed Design phase is one of the enablers as it allows the future ADA to:

- get acquainted with the involved technologies on board the ACS;
- learn and practice the detailed arrangement skills and rules; and
- acquire and develop an overall knowledge of the ACS architecture, functional performances and General Transverse Requirements of the ACS.

The arrangement activity within the Detailed Design phase is separated into two main parts:

Part 1: Locating, in principle, all the equipment into the digital mock-up, whilst integrating all the preliminary design constraints (DP4.1). It is considered that this first part requires a significant portion of experience; and

Part 2: Preparing the production engineering through populating the relevant Product Lifecycle Management (PLM) databases (DP4.2).

s47, s47C, s47G

Naval Group emphasizes that all options include in parallel:

- arrangement On the Job Training (OJT) of Australian teams in France, during the Basic Design Phase (DP3);
- a progressive transfer of functional & transverse capabilities and the associated accountability for Naval Group Australia, as the growing design authority for sustainment. This occurs as soon as the Detailed Design begins (after the Preliminary Design Review); and
- downstream production engineering, which is 100% performed in Australia by Australian teams.

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CDR ToT-130

COMMONWEALTH OF AUSTRALIA  
Submarine Design Contract



Final  
FUTURE SUBMARINE PROGRAM  
TWFOR

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DOC-2019-701210 - C  
December 2019



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## 2 Introduction (FGD - ~~FOUO~~)

The ToT Way Forward Options Report (TWFOR) defines and analyses the workshare related to the detailed design phase (DP4) to ensure that:

- a capability is transferred from Naval Group SA to Naval Group Australia to ensure an establishment of a sovereign capability to operate and sustain the future submarine; and
- maximise opportunities for the involvement of the Australian industry through all phases of the FSP, without unduly compromising the Commonwealths requirements relating to capability, cost and schedule.

The total capability which is transferred to Naval Group Australia is achieved not only through the arrangement studies (focused on in this report), but also on the studies undertaken by the rest of the ADA. Figure 1 shows the ramp-up of the total engineering studies in Australia and it can be seen that arrangement engineers only make up a portion of the design team for sustainment. The total number of arrangement designers required for the sustainment period is approximately 53 resources.

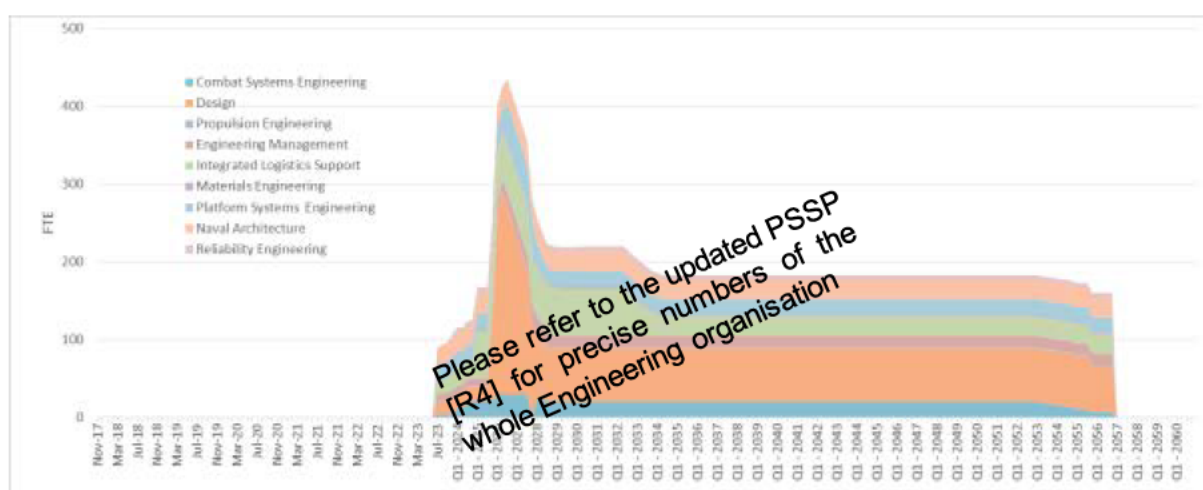


Figure 1. ADA for Sustainment for the entirety of the FSP

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s47, s47C, s47G

s47, s47C, s47G

## 2.1 Purpose of the Document

The ToT Way Forward Options Report (TWFOR) is used:

- a. to summarise the current baseline for the ToT program, as set out in the Approved ToT Strategy, the Approved ToT Plan, the Approved ToT Master Training Plan (MTP), the approved IMS and the Approved Program Cost Estimate (PCE) ('Approved ToT Baseline Data Items');
- b. to identify the options against the current baseline for the ToT program set out in the Approved ToT Baseline Data Items, including the associated costs, benefits and risks, in relation to:

s47, s47C, s47G

- c. as one of the inputs to the ToT Way Forward Review (WFR) to enable decisions to be taken in relation to the location(s) for conducting the detailed design work and the implementation of the associated ToT program for the Australian Subsidiary and the broader Australian industrial base; and
- d. to assist with setting the direction for the ToT program and other affected elements of the FSP, which include (for example):

s47, s47C, s47G



s47, s47C, s47G

The Contractor uses the TWFOR to:

- a. describe the Detailed Design DP4 Phase to the extent necessary to be able to identify and describe the implications for, and the linkages associated with the ramp up and achievement of the following ToT Capabilities:
  - (v). Capability to Carry Out Detailed Design; and
  - (vi). Design Authority for Sustainment.
- b. identify and describe the options for the ToT Program against the baseline set out in the Approved ToT Baseline Data Items in relation to:
  - (vii). the locations for conducting any detailed design work that is not currently programmed to be conducted in Australia, including identifying the broader implications for the FSP; and
  - (viii). the envisaged implementation of the ToT program for each of the location options, including possible alternatives (e.g., in relation to Training and the involvement of Australian industry) and the associated implications for other parts of the FSP, including the relation to cost, benefit and risk;
- c. provide sufficient information to achieve the objectives of the ToT WFR, as set out in clause 14.5.4 of the Submarine Design Contract (SDC) Scope of Work (SOW); and
- d. facilitate the subsequent development of an update to the Transfer of Technology Plan (ToTP) and the associated Contract Change Proposal (CCP) to bring the full scope of the ToT program for the Australian Subsidiary into the Contract.

The Commonwealth uses the TWFOR:

- a. to understand and evaluate the Contractor's approach to conducting detailed design, particularly in relation to the implications for achieving the Sovereignty requirements of the FSP and the Contract;
- b. to understand and evaluate the Contractor's approach to meeting the ToT requirements of the FSP and the Contract in relation to the ToT Capabilities of Capability to Carry Out Detailed Design and Design Authority for Sustainment;
- c. to understand and evaluate all of the implications for the FSP associated with the different options for the ToT program, including in relation to the location(s) for conducting the detailed design work;
- d. to assist with setting the direction for the ToT program and other related elements of the FSP; and
- e. as an input into its own planning.

## 2.2 Background

## 2.3 Overview of the Data Item

The TWFOR is subordinate to the following data items, where these data items are required under the Contract:

## a. Project Management Plan (PMP).

The TWFOR inter-relates with the following data items, where these data items are required under the Contract:

- a. Transfer of Technology Strategy (ToTS);
- b. Transfer of Technology Plan (ToTP);
- c. Transfer of Technology Master Training Plan (ToT MTP);
- d. Australian Subsidiary Capability Realisation Plan (ASCRP);
- e. Australian Industry Capability Strategy (AICS);
- f. Australian Industry Capability Plan (AICP);
- g. ICT Delivery Plan;
- h. Contractor IPDSE Development Plan (CIDP);
- i. Engineering Management Plan (EMP);
- j. Risk Management Plan (RMP);
- k. Program Cost Estimate (PCE);
- l. Program Staff Skills Profile (PSSP); and
- m. Integrated Master Schedule (IMS).

## 2.4 Referenced Documents

- [R1] DID-ToT-TWFOR  
 [R2] Strategic Partnering Agreement (SPA)  
 [R3] Engineering Management Plan (Ref DOC-2017-700831)  
 [R4] Program Staff Skills Profiles (Ref DOC-2017-703189)

## 2.5 Definitions

The following key terms are used throughout this document.

Table 1.

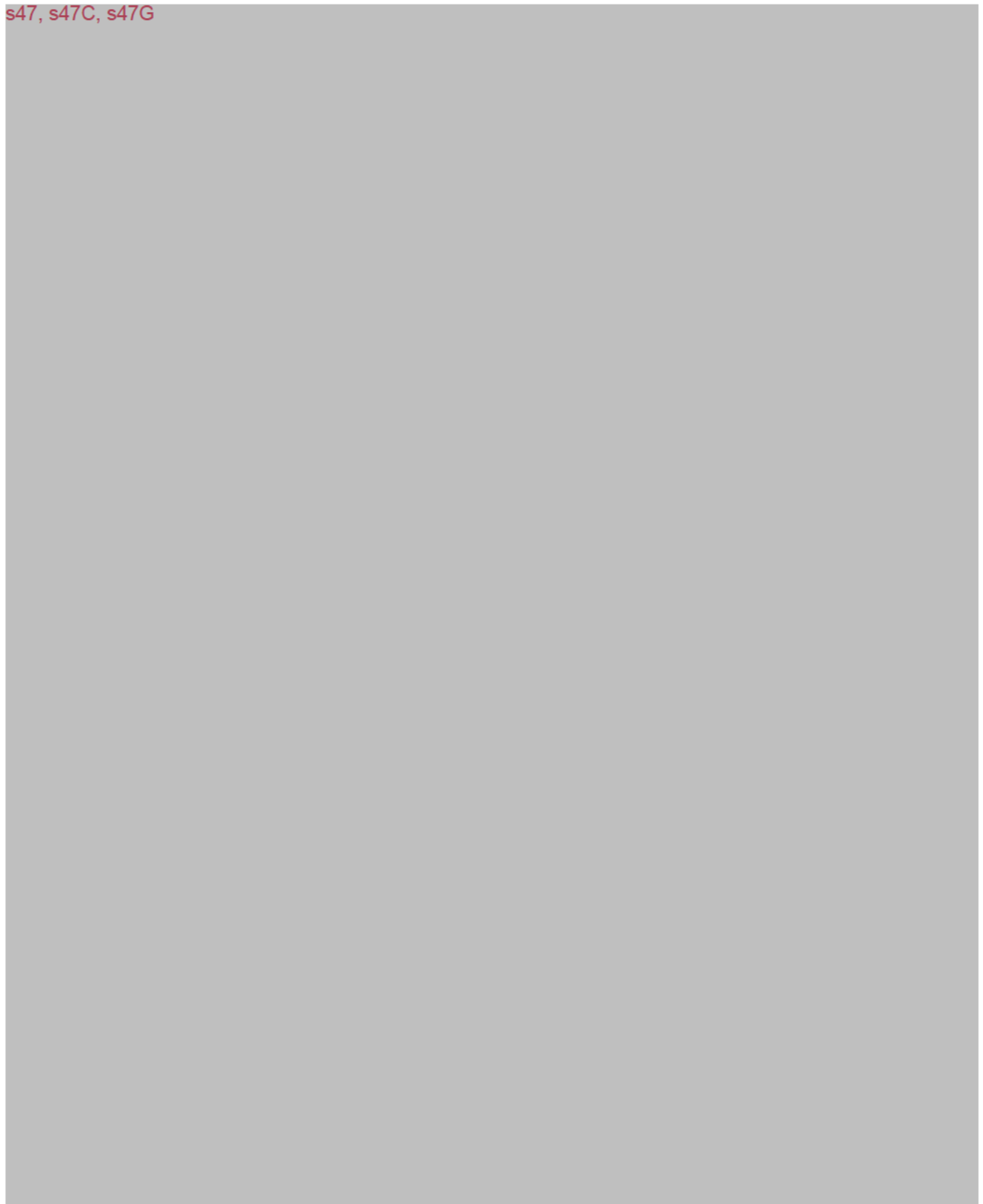
Key Terms

Key Term	Meaning
Commonwealth Contractor	Means any person, other than the Contractor, engaged by the Commonwealth in connection with the FSP, including the CSI.
Contract	Means the COC, the Attachments including the Statement of Work, and any document expressly incorporated as part of the Contract.
Contract Data Requirements List or CDRL	Means Annex C to the SOW.
Customer, Commonwealth	Department of Defence of the Commonwealth of Australia, ABN 68 706 814 312
Contractor	Means Naval Group.
Data item review	In relation to a data item, has the meaning given in clause 1.6.3 of the SOW.
DP	Naval Group Design Process, part of Naval Group Business Management System (BMS)

Key Term	Meaning
Effective Date or ED	The date on which the Contract signed by the parties enters into force
Engagement Plan	Is the schedule of the management meetings and joint workshops between Naval Group and the other primary stakeholders
Future Submarine or FSM	Means the submarines to be acquired by the Australian Government for service in the Royal Australian Navy under the Future Submarine Program.
Future Submarine Program or FSP	Means the Commonwealth's Future Submarine Program and includes all activities connected with that Program, including all elements of the design, development, build, operation, sustainment and disposal of the Materiel System during its life of type
IDD	Interface Description Document
Intellectual Property or IP	Means all present and future rights conferred by law in or in relation to any of the following: <ul style="list-style-type: none"> <li>• copyright;</li> <li>• rights in relation to a Circuit Layout, Patent, Registrable Design or Trade Mark (including service marks); or</li> <li>• any other rights resulting from intellectual activity in the industrial, scientific, literary and artistic fields recognised in domestic law anywhere in the world whether registered or unregistered.</li> </ul>
PR	Naval Group production process, part of Naval Group BMS
Program	Means the Future Submarine Program or FSP
Program Contract	Means any contract, agreement or arrangement with the Commonwealth for the FSP to which the Contractor is a party, or which otherwise states that it is a Program Contract for the FSP, including the: <ul style="list-style-type: none"> <li>• contract;</li> <li>• Strategic Partnering Agreement or SPA;</li> <li>• Tripartite Co-operative Agreement or TCA;</li> <li>• Design Contract; and</li> <li>• any other relevant contracts for the completion of design and initial production, and the completion of production, of the Future Submarines</li> </ul>
Project	Means the Design Management Contract (DMC).
Proxindus	Means the direct support team of the production, which <ul style="list-style-type: none"> <li>• has responsibility to take immediate decisions to manage production's difficulties; or</li> <li>• manages the interface with the design team when the decision needs the approval of the Design Authority.</li> </ul>
SEMP	Systems Engineering Management Plan.

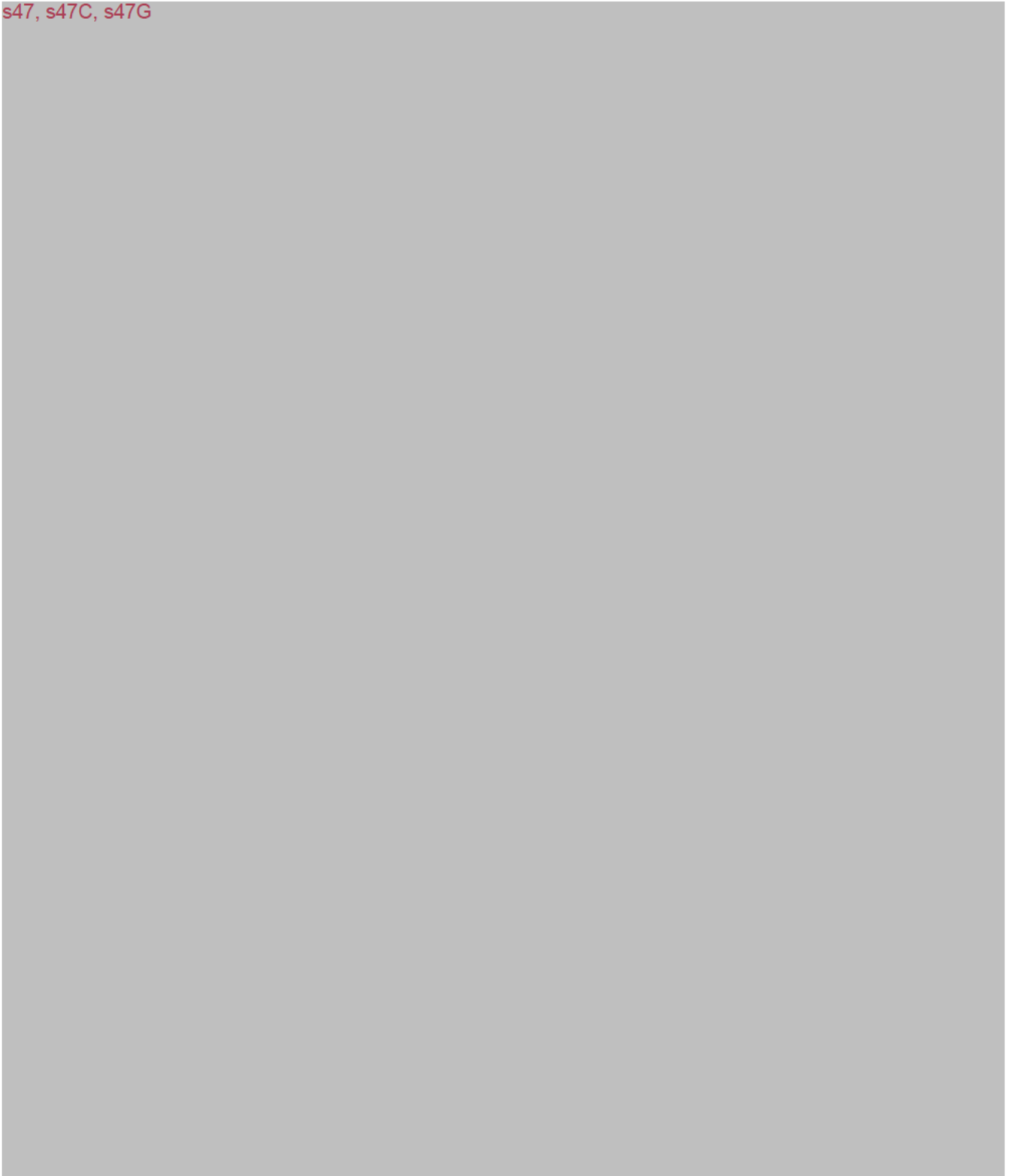


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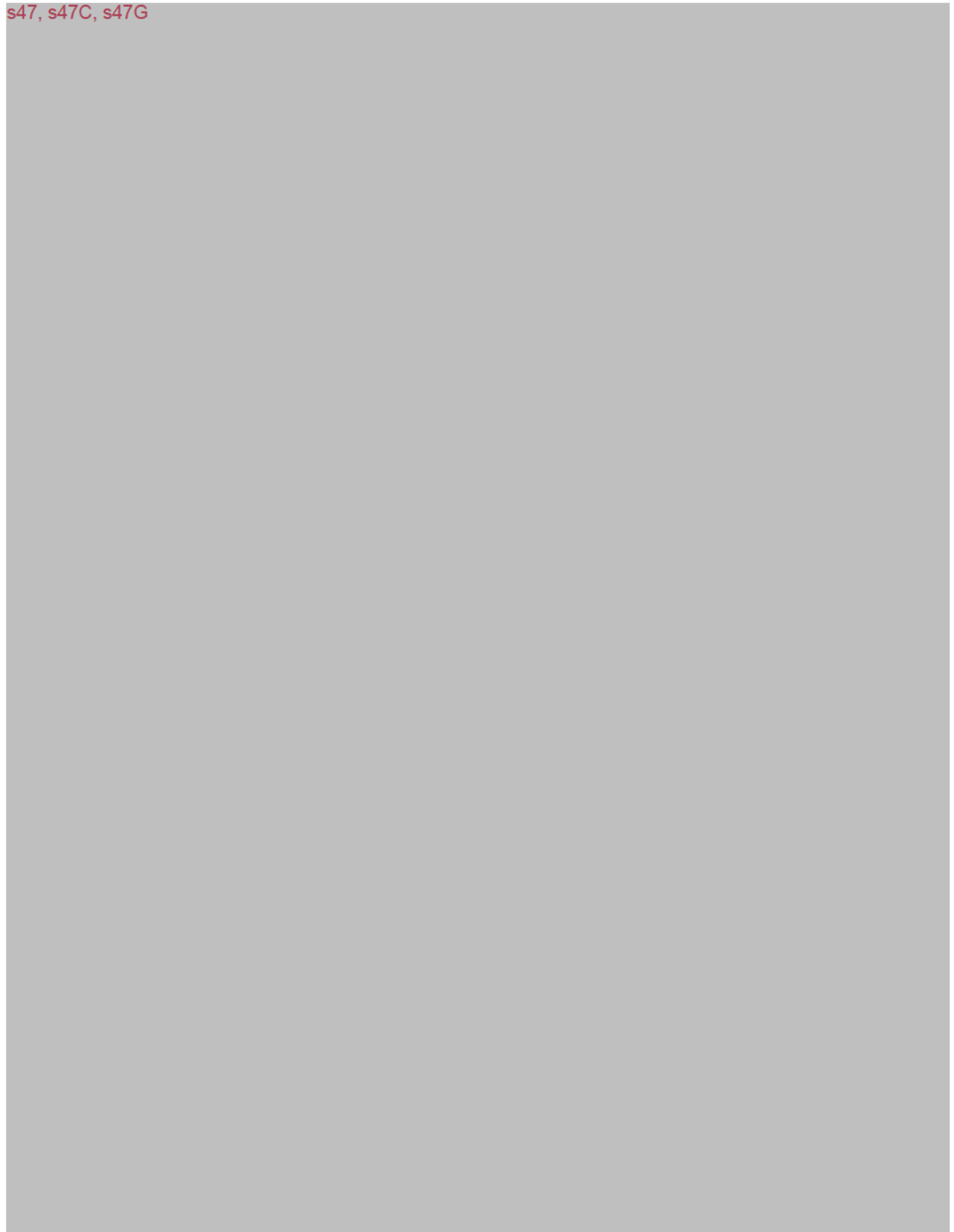


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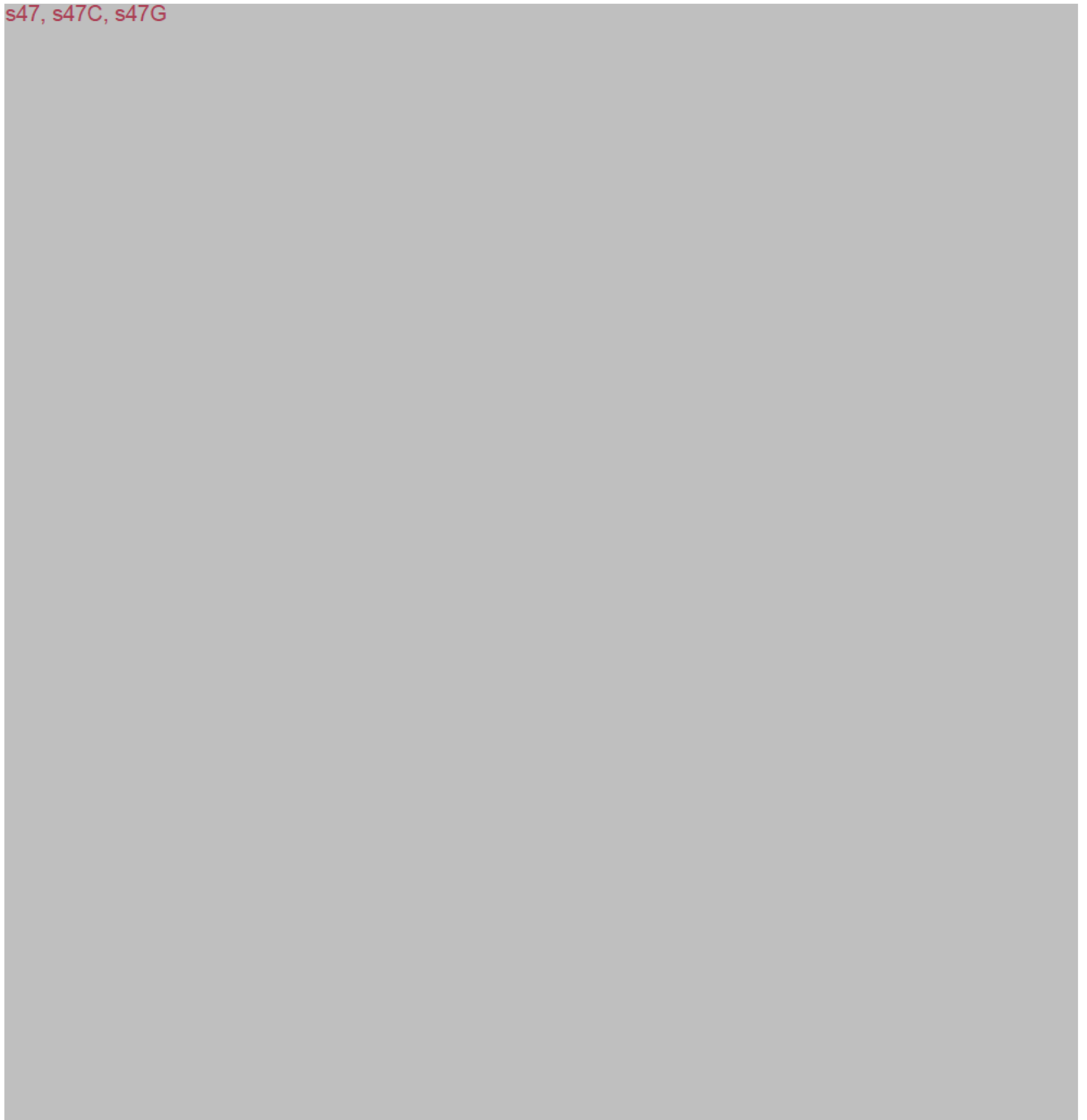


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## 4 General

### 4.1 Objectives and Constraints (FGD - ~~FOUO~~)

#### 4.1.1 Objectives

The objectives taken into account for the analysis of the different transfer options of the detailed design from France to Australia are:

- a. ensure feasible Program execution;
- b. minimise overall risks;
- c. respect the IMS (date of delivery of the FoC);
- d. maximise the work done by Australians (either in France or in Australia);
- e. deliver sovereignty: prepare the Design Authority capability for operation and sustainment to Naval Group Australia (detailed design constitutes one out of several enablers for this); and
- f. minimise the overall cost without unduly jeopardizing above criteria.

#### 4.1.2 Constraints

The following constraints have been identified and are used for the comparison of the different options:

- the organisation between Naval Group SA and Naval Group Australia has to be as simple as possible;
- the retention of the Australian workforce trained in France or in Australia;
- the impact on the ICT;
- the workload with respect to other Naval Group programs;
- the difficulties to send Australians to France for training; and
- the difficulties to send experienced French people to Australia<sup>1</sup>.

### 4.2 Lessons Learned from Previous Programs (NAVAL GROUP SA BGD - DR)

s47, s47C, s47G

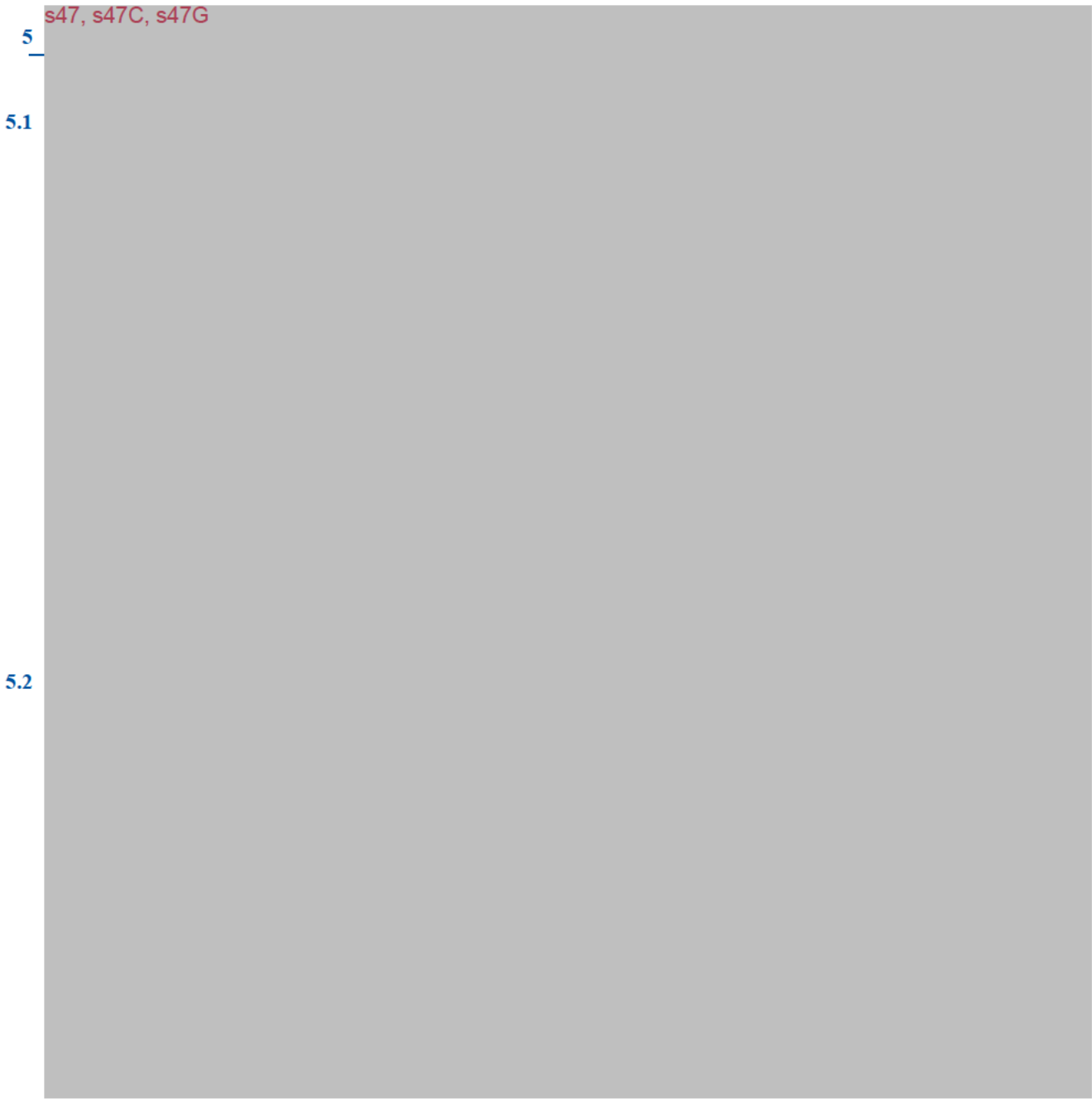
<sup>1</sup> This covers two issues:

- finding enough experienced people willing to come to Australia; and
- allowing them to work in the shipyard, and not only provide technical assistance.



s47, s47C, s47G







s47, s47C, s47G





### 5.3 Milestones (NAVAL GROUP SA BGD - DR)

The official milestones of the DP4 phase are:

- Critical Design Review (CDR): Detail design review; and
- Critical Manufacturing Review (CMR): Detailed production engineering review.

#### 5.3.1 CDR

Critical Design Review (CDR): this detailed design review requires lower-level CDRs to already have been performed. The purpose of the CDR is to;

- evaluate the impact of the system component detailed design on its architecture and ensure they do not compromise the solution;
- evaluate the detailed design for the solution, including all components and interfaces; and
- ensure that detailed design meets requirements of the solution;
- ensure that the baseline for the definition Product Baseline (PBL) is complete.

The Whole Warship CDR does not correspond to the end of the detailed studies but to the achievement of a readiness level from which the production, assembly, integration and tests can be started without unmanaged risk on the final performance levels of the product and to be in accordance with the cost and lead time constraints.

At the WW CDR, the arrangement input data is set, the detailed arrangement studies continue at the same time as the detailed production engineering activities.

#### 5.3.2 CMR

Critical Manufacturing Review (CMR): for the detailed production engineering review, the lower-level CMRs must have already been performed. The purpose of the CMR is to ensure that the upper-level production engineering can be consolidated:

- evaluate the detailed production engineering for the solution, including all components and interfaces;
- ensure that detailed production engineering meets requirements of the solution;
- evaluate the completeness and robustness of production engineering data; and
- ensure that the baseline for production engineering Manufacturing Baseline (MBL) is complete.



## 5.4 Input and Output data for DP4 (NAVAL GROUP SA BGD - DR)


s47, s47C, s47G



s47, s47C, s47G




s47, s47G



5.5

s47, s47G



CDR ToT-130

Final

COMMONWEALTH OF  
AUSTRALIA

Submarine Design Contract



FUTURE SUBMARINE PROGRAM

TWFOR

s47, s47G



DOC-2019-701210 - C  
December 2019



Originator: Australia and France

**NAVAL**  
GROUP

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## 5.7 Whole Warship Engineering organisation (FGD – ~~FOUO~~)

The Engineering organisation in force is described in the Engineering Management Plan [R3]. An extract is presented in the figure 5 hereunder. The detailed Engineering organisation and worksharing for DP4 will be described in the Detail Design Transition Plan. The overall estimated numbers of personnel required across the phase is provided in the PSSP [R4]. The detailed allocation of people per sub-phase will be possible once the transition plan will be available.

CDR ToT-130

Final

COMMONWEALTH OF AUSTRALIA

FUTURE SUBMARINE PROGRAM

Submarine Design Contract

TWFOR

s47, s47C, s47G

DOC-2019-701210 - C  
December 2019

Originator: Australia and France



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## 5.8 NGA Workforce Needed for DP4 (FGD - ~~FOUO~~)

### 5.8.1 Proposed Organisation

This section provides the proposed skills for the Naval Group Australia engineering entity.

The proposed organisation in this document may be required to be updated according to the needs of the program, or to increase the efficiency of the organisation:

- for example, the interface between design and production engineering may require some adaptation of the organisation;
- the skills and organisation proposed for the PLTBF and ALTBF will be updated when:
  - the full operational needs of the PLTBF have been defined and agreed; and
  - the scope and definition of the ALTBF has been agreed.

### 5.8.2 Organisation chart

Figure 6 presents the proposed organisation of engineering department and the expected numbers of level A, M & E people.

At this point in time the PLBTF and ALBTF are attached to the engineering organisation.



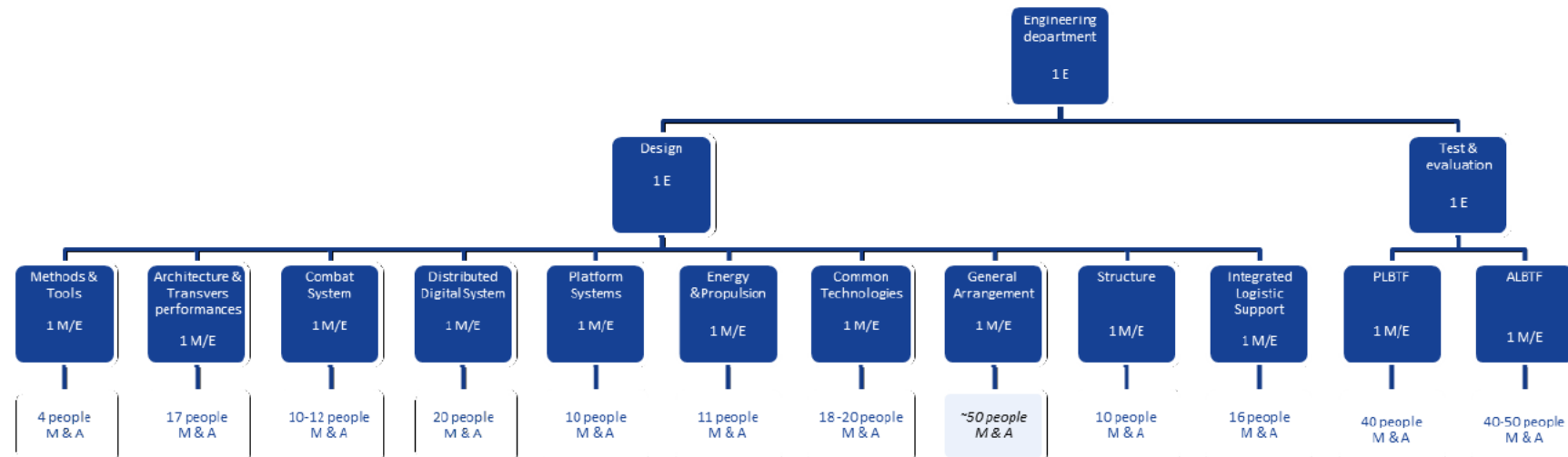


Figure 6. Engineering Department Organisation



### 5.8.3 Proposed Engineering Office

This section presents the skills for the different technical departments or groups of the Naval Group Australia Engineering Office.

#### 5.8.3.1 Technical Management

The Chief Technical Officer (CTO) is responsible for the technical management of the engineering department.

Department (or group) leaders support the CTO for their respective technical domain. Department leaders will be the recipients of the design authority delegated to Naval Group Australia for their respective domains.

At this stage, the engineering Method and Tools group is directly attached to the CTO.

#### 5.8.3.2 Architecture / Transverse Activities

This department hosts the architects, the systems engineering team and the transverse team:

- Architects:
  - Program CTO (Whole of Warship Architect);
  - Naval architects; and
  - Weight & stability engineers.
- Systems Engineering;
- Seaworthiness;
- Human System Interface; and
- Military performances:
  - Shock; and
  - Acoustic signature.

#### 5.8.3.3 Platform Systems

The department is managed by a department leader who is responsible for the organisation of the department and for the verification of technical documents.

The engineers will be split in two main categories:

- system leads, in charge of one system group (WATS, MOBI, ACCM, SFTY); and
- engineers attached to the department, working for the different system leads.

#### 5.8.3.4 Energy & Propulsion System

The department is managed by a department leader who is responsible for the organisation of the department and for the verification of technical documents.



The engineers will be split in two main categories:

- system leads, in charge of one system group (PROP,DGAU,BATT,PGEN, ELEC); and
- engineers attached to the department, working for the different system leads.

#### 5.8.3.5 Common Technologies

This department is managed by a department leader who is responsible for the organisation of the department and for the verification of technical documents.

This department is responsible for the qualification of Common Technologies, either because of obsolescence or for new requests. The technologies are:

- fluid;
- electrical;
- instrumentation;
- material and welding;
- paint;
- floor covering;
- insulation (thermal, soundproofing, etc.); and
- noise and vibration.

#### 5.8.3.6 Combat System

This department is managed by a department leader who is responsible for the organisation of the department and for the verification of technical documents.

This department is responsible for the physical integration of the combat system and for the activities related to Naval Group Combat System subsystems (weapon launching system, masts, etc.).

#### 5.8.3.7 Structure

This department is managed by a department leader who is responsible for the organisation of the department and for the verification of technical documents.

This department is responsible for the activities related to resistant and non-resistant structures.

#### 5.8.3.8 Arrangement

This department is managed by a department leader who is responsible for the organisation of the department and for the verification of technical documents.

This department is responsible for the arrangement activities (3D mock up), and will also provide the drawings required by the detailed production engineering team (attached to the production).

The size of the team during DP4 depends on the options as presented in this report. Following the DP4 phase, there is a requirement for a minimum of 50 people to manage the sustainment of the FSM.



The required positions and skills are:

- Whole Warship arrangement leader;
- sector arrangement designers: responsible for a geographical sector of the boat;
- arrangement designers: responsible for one, or several compartments; and
- CAD designers who work for the Arrangement designers. The different skills required are:
  - Pipe CAD designer;
  - Electric CAD designer;
  - Ventilation CAD designer;
  - Seating CAD designer; and
  - Seating FEA engineer.

#### 5.8.3.9 **DDiS**

This department is managed by a department leader who is responsible for the organisation of the department and for the verification of technical documents.

This department is responsible for the Ship Management System and Cyber activities.

#### 5.8.3.10 **Integrated Logistic Support**

This department is managed by a department leader who is responsible for the organisation of the department and for the verification of technical documents.

This department is responsible for the ILS activities.

#### 5.8.3.11 **Test and Evaluation**

The organisation required to manage the Test and Evaluation will be:

- Test qualification and acceptance of the FSM:
  - IV manager; and
  - IV test engineers.
- Platform Land Based Test Facility:
  - PLTBF Manager;
  - Test leaders;
  - Mechanical System Manager supported by DGR and maintenance specialists; and
  - Electrical & Propulsion managers supported by MEM, MSB and electrical specialists.
- Adelaide Land Based Test (ALBTF) Facility:
  - ALBTF manager;
  - Diving safety team;
  - Noise and vibration team<sup>2</sup>; and
  - Welding team.

<sup>2</sup>This team will also support the PLTBF tests.



#### 5.8.4 Justification of the Proposed Organisation

To identify the required skills, Naval Group used:

- an analysis of the design office of the Naval Group Division Services in France, which is in charge of the sustainment; and
- an analysis of the workload for the design activities transferred to Australia.

#### 5.8.5 Tasks already started in Australia

Naval Group Australia already started some design activities, under the French design authority:

- Sourcing and qualification of Common Technologies (CT),
- Support to sourcing and qualification of Critical and Main (C&M) equipment (including the PLBTF equipment),
- Participation of the development and validation of the Ship Management System (SMS).

##### 5.8.5.1 Common Technologies

Common Technologies are equipment that can be used by all system leaders and their team to design the submarine systems and subsystems.

The sourcing of Fluid and Electrical Common Technologies is an activity that started in Australia during the Design and Mobilisation Contract (DMC) and will continue all along the program:

- Sourcing and qualification of initial equipment
- Ongoing work to answer to the request coming from the design team,
- Management of the obsolescence of the qualified technologies.

The technologist team from Naval group Australia works under the design authority of the French technologist team. The transfer of responsibility will happen before the start of the sustainment phase of the FSM.

##### 5.8.5.2 Critical and Main equipment

C&M equipment are specified by the French system leaders according to the design of the systems.

Naval Group Australia Procurement team is in charge of the sourcing of these pieces of equipment in Australia, and is supported by the engineering team. France will stay the design authority for C&M equipment until the start of the sustainment phase.

This activity started during CWS1 of the Design Contract.

##### 5.8.5.3 Ship Management System

The strategy to transfer the knowledge for the SMS is that Naval Group Australia participates to the design of the system, under the design authority of the French team.

The work has been shared between the two teams, and Naval Group Australia is in charge of





- the V&V for the whole SMS,
- the development of some of the software.

The work has started during CWS1 of the DC and the cooperation is supported by a common working environment provided by the Application Life Management (ALM) tool.

#### 5.8.5.4 Integrated Logistic Support

ILS activities starts in Australia during CWS1 and supports the PLBTF and SCY equipment. Australian engineers also go to France (the first one went in 2018) to be embedded in the French ILS team. The bulk of ILS activities will be transferred to Australia during the DP4 phase.

#### 5.8.6 Functions performed by the Design Authority For Sustainment

Naval Group Australia will be the Design Authority for the sustainment of the FSM. The different activities to be performed will be:

- Design of the second batch of the FSM,
- Engineering support after the delivery of the submarines:
- Management of the configuration of the submarine,
- Design of the modifications requested by the CoA,
- Management of the technical interface with the Combat System Integrator (CSI), this may include design of modifications requested by the CSI
- Analysis of the technical events (failures, loss of performance...),
- Management of the technical obsolescence,
- Engineering preparation and support to the intermediate maintenance,
- Engineering preparation and support of the FCD, the preparation of the first FCD will start about two years before the FCD.

In this perspective, the Australian DA team will be trained in France:

- Theoretical training (3 to 4 months),
- On the Job Training (OJT) embedded with the French design team.

This training will provide the required competencies:

- knowledge required for the design of the second batch:
  - Design process,
  - Naval group Technical instructions,
  - Understanding of the design of the FOC,
  - Understanding of the technologies, equipment.
- knowledge required for the Engineering support after the delivery:
  - Naval group Technical instructions,
  - Understanding of the design of the FOC,
  - Understanding of the technologies, equipment.
- Knowledge required for the Engineering of the MCD and FCD and support to the maintenance shipyard:
  - Naval group Technical instructions,
  - Understanding of the design of the FOC,
  - Understanding of the technologies, equipment.



### 5.8.7 Transition activities

Before transferring the Design Authority to Australia for the sustainment of the FSM, part of the future DAFS will perform the following activities:

- PLBTF: support provided during the tests of the Energy and Propulsion system,
- HQTS: in country engineering support to production,
- Qualification of the PLM: part of the DA team will run the test cases for the qualification of the PLM in Australia,
- Prototype CS raft: the design of the prototype CS raft will be completely done in Australia (DP4.1 / DP4.2.....),

### 5.8.8 Sourcing of subcontractors for the detailed design

Naval Group Australia started the sourcing process for subcontractors for:

- Arrangement studies,
- Functional and structure studies.

The sourcing for arrangement studies started in 2018 (EOI, analysis of the answers, RFI, analysis of the supplier's answers) and is continuing (short list of suppliers, RFTD, meeting with the suppliers early 2020), the objective is to provide a short list and a procurement strategy mid 2020.

The sourcing for functional and structure studies started in 2019 (EOI, analysis of the answers, RFI, analysis of the supplier's answers) and will be performed by the end of 2019 / early 2020. Then the process will continue on the same basis of the arrangement studies.

A tentative roadmap for Detailed Design sourcing activities is presented below. This roadmap may be updated after validation by all stakeholders.





s47, s47C, s47G



Part of the arrangement designers that will be trained in France will be subcontractors: 48 Naval Group employees and 48 subcontractors will be trained and will have OJT in France.

If the Australian subcontractors are subsidiaries of French companies, then these companies will be asked to organise the training of their Australian employees in the parent company in France.

We encourage and pay attention to suppliers in Australia who present strategic plans to acquire competencies for submarine detailed design prior to the beginning of AFS detailed design activities. At present, one potential supplier has presented this type of plan which is considered with interest by Naval Group

### 5.8.9 Detailed Design Transition Plan

s47, s47C, s47G

This document will provide for each family of technical activities (architecture, transverse, functional, structure, arrangement...):

- The responsibilities of the French and the Australian teams,
- The tasks performed either in Australia or in France,
- The organisation / methods between the teams,
- The use cases to test the methods and validate the PLM,
- The workload for each team,

This work will happen in the first half of 2020 (pending a decision on the design option no later than end of November).

A tentative schedule of this work is:

- Organisation of the work: November / December 2019
- Kick off meeting: end of January 2020,
- Intermediate workshop: March 2020,
- End of the work: end of May 2020.

The suggested interactions with the CoA are:

- First meeting after the Kick off meeting: February 2020,
- Second meeting after the intermediate workshop: April 2020,
- Third meeting after the end of the work: June 2020.

### 5.8.10 Technical and Further Education Providers

All options require training to be organised in Australia for arrangement studies and detailed design engineering training. As described in Figure 8, Naval Group has established a contractual organisation between TAFE SA and AFPA to be able to develop a Training Need Analysis (DOC-2019-702157) in the field of the detailed design.



The TNA will provide the critical input of the competency gap between what currently exists in Australia and what is required to perform detailed design activities. It will also examine the potential employment market for detailed design activities. Naval Group will further develop the TNA in the next phase concerning the establishment of the trained workforce in Australia, combining the contribution of external RTOs (Registered Training Organizations) and execution of internal NG Detailed Training Plan (DTP).

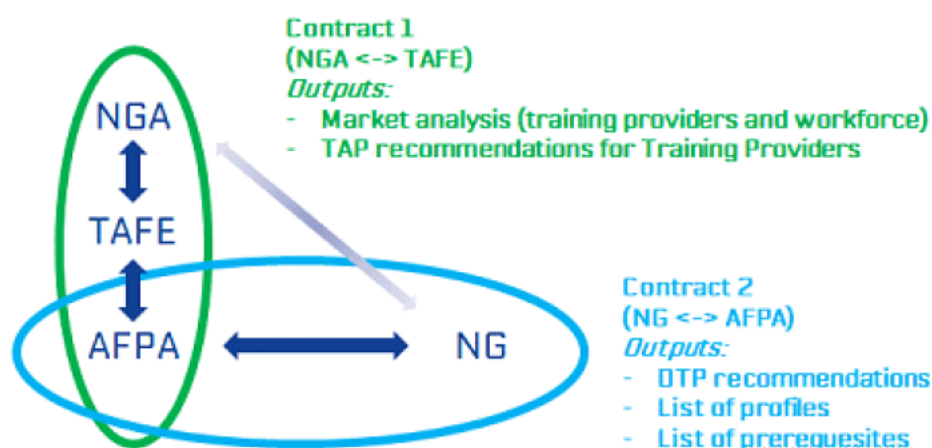


Figure 8. Contract Description with TAFE and AFPA

### 5.8.11 Existing Drafter Workforce in Australia

As part of the TNA, and to help inform the workforce development planning, Naval Group engaged Kinexus to undertake a detailed analysis of the Australian drafter workforce. The complete outcome of this report is embedded in the Detailed Design TNA report.

The total size of the drafting workforce in Australia has been assessed as just below 11,000 people, of which, approximately 7200 have an experience in an area with links to Naval Group Australia needs. The data is shown in Table 2 and Table 3.

It is noted that the Level M's considered in the tables below would still require a basic training to learn Naval Group's design process, tools and methods.



*Experience (SAME) of the Drafter workforce*

	Piping	Electrical	HVAC	Outfitting	Fire	PLM	Naval Experience	Siemens NX Software	Shipbuilding Specific Software	Product data Management	3D Design	Total	%
S	387	273	142	182	59	0	134	0	0	0	0	1177	16%
A	640	112	106	0	15	25	124	124	862	47	3942	5997	83%
M	11	8	4	0	3	0	17	0	0	0	10	53	1%
E	0	0	0	0	0	0	0	0	0	0	0	0	0%
											TOTALS	7227	

*Location of the Drafter workforce*

Location	Number	%
Adelaide	505	6%
Melbourne	2084	23%
Perth	1575	17%
Brisbane	1762	19%
Sydney	1855	20%
Rest	1290	14%
Total	9071	



The two main outcomes from the Kinexus report are:

- the analysis could not find any Level E drafters in Australia; and
- Melbourne has the largest supply of drafters in Australia, and Adelaide has a relatively small drafter workforce with only 6% of the workforce.

These main outcomes from the Kinexus report support the assumptions taken into account in the ToT-WF Report:

- all level E people will be provided by Naval Group SA; and
- a second location would be required for options s47, s47C, s47G

## 5.9 Significant ICT Resources needed for DP4 (FGD – ~~FOUO~~)

Key ICT resources enable the execution of the design process. The collaboration and knowledge transfer will be mainly focussed on the PLM, ERP and OPTI. A SM Pilot is also forecasted to be deployed in Australia to ease the transfer of technology and to anticipate any required change management around methods and tools.

s47, s47C, s47G



The key assumptions for basic design are;

- 3DX instances in France only;
- OPTI Instance in France to control program « cost & schedule »;
- OPTI Instance in Australia to schedule submarine Assembly Yard activities;
- Articles are created only in PIM FR;
- ERP (Oracle) in Australia to supply and procure parts; and
- Unlike DP3, it is possible to manage purchase orders in degraded mode, (only critical items).

And the key assumption for the end of DP4 is:

- All tools in AU with remote access from FR

The localization of key ICT resources for the different scenarios during the detailed design phase are described in the ICT assessment for each option.

The schedule of deployment can be different for the different options, but the ICT masterplan is sized on the most constraining cases, to keep compatible with the design process and TOT activities.

s47, s47C, s47G



## 6 ToT Strategy Options (FGD - ~~FOUO~~)

### 6.1 Rules and Assumptions

To reduce the risk associated with the design during DP4 and its impact on the schedule and production (namely re-work for the FoC), the workforce needed to perform the design has to undergo preliminary training and gain appropriate experience on working on a submarine design. Depending on the different skills required, there are specific Submarine Designer rules and guidelines, which are defined, to reduce the risk on the design and schedule. Such rules and guidelines are defined in the following sections of this document and are considered as applicable for the analysis of all considered options.

Other assumptions, which are not considered to be ToT specific, are also defined.

#### 6.1.1 Rule 1 (ToT) – S.A.M.E Levels

The requirements to achieve the S.A.M.E levels are the following:

- S: has completed a theoretical course;
- A: level S plus completed a practical course;
- M: level A plus one year of on the job training on the same activity;
- E: level M plus an experience on the same activity already performed on a program with a full DP4 cycle.

The assumption is that all the Level E arrangement designers will need to be provided by Naval Group SA since there are no Level E people existing in Australia, this is supported in Section 5.8.11. The exception will be if Naval Group Australia is able to recruit people from other countries' programs who have undertaken a detailed design phase.

#### 6.1.2 Rule 2 (ToT) – S.A.M.E Ratios

Stemming from previous Naval Group experiences, the adequate ratio for each category of S.A.M.E to achieve the DP4 Arrangement is as shown in Figure 11 below.

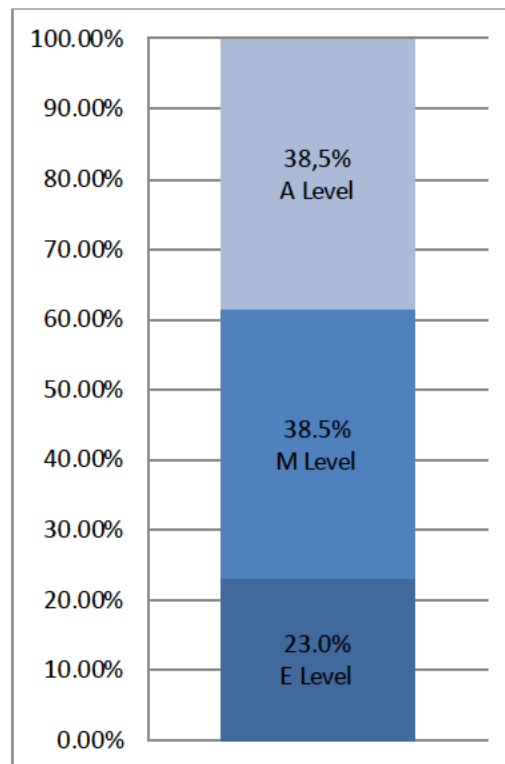
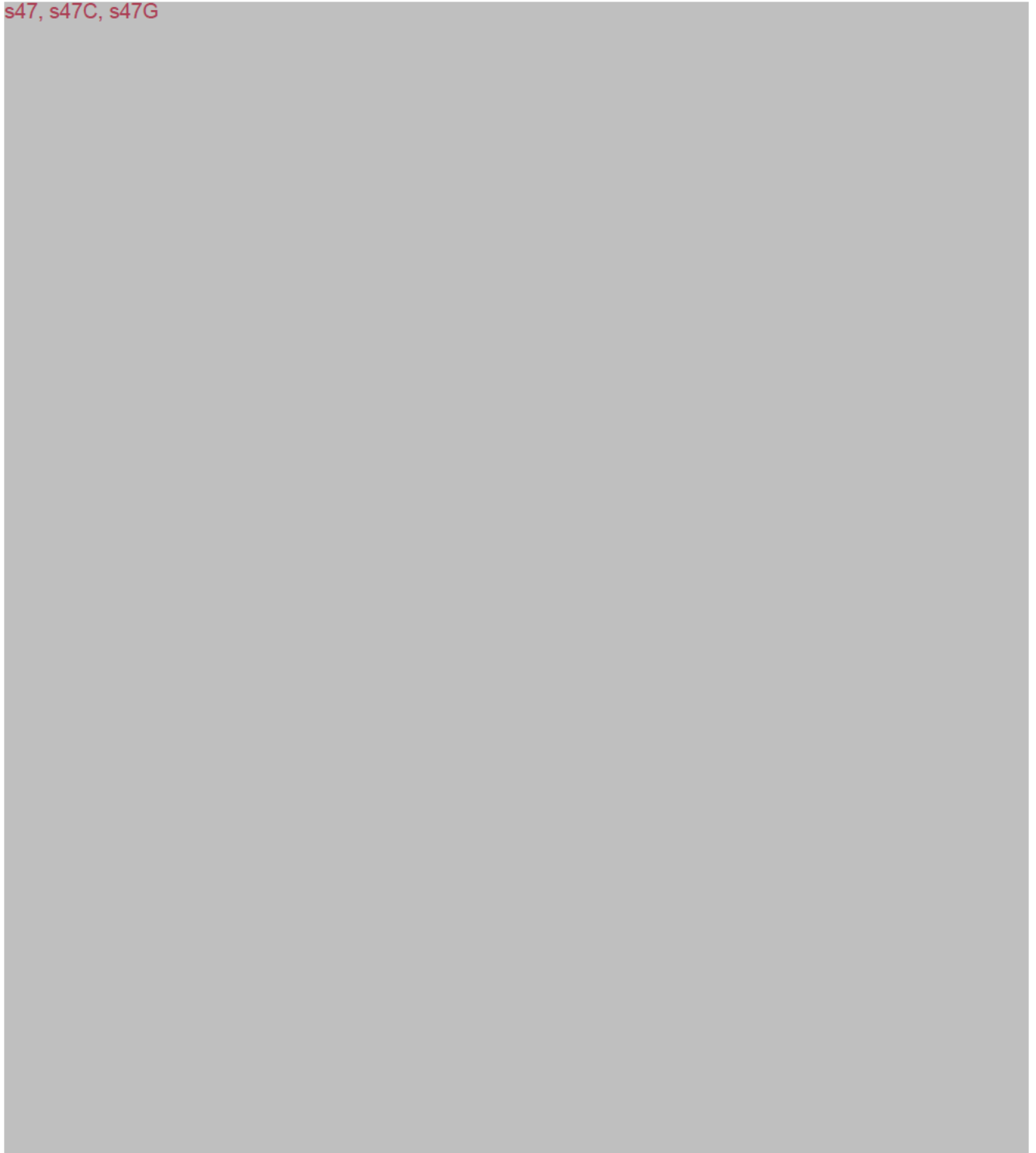


Figure 11. S.A.M.E Ratio in Australia for the Different Options

It is noted that this is the required ratio for the whole team, in France plus in Australia for the core work, back office and technical assistance combined. Furthermore, it is possible to adjust the ratio within France or Australia depending on the complexity of the work. For clarity, Table 4 demonstrates the composition of the whole team for all the data presented later in this report.



s47, s47C, s47G



s47, s47C, s47G

### 6.1.3 Rule 3 (ToT) – On the Job Training Ratios

On The Job Training (OJT) is considered to be achievable if the team satisfy the following conditions:

- minimum of 1/3 of skilled workers;
- maximum of 1/3 of skilled subcontractors; and
- maximum of 1/3 trainees.

### 6.1.4 Rule 4 (ToT) – Technical Assistance Ratios

For arrangement, the level of technical assistance versus the size of the team is:

- 10% if the team has already done OJT on the activity with same methods and tools; and
- 20% if the OJT has not been performed in the previous conditions (not exactly the same activity or not the same methods and tools).

For industrialisation, the level of technical assistance versus the size of the team is:

- 50% for the bill of materials activities in option s47, s47C, s47G since no similar activity is performed in France in the OJT; and
- 25% for all others cases.

### 6.1.5 Rule 5 (ToT) – Counselling Ratios

The student counselling ratio during the OJT is 1 mentor for 10 students.

### 6.1.6 Rule 6 (ToT) – Front Office vs Back Office Ratio

To support a front office efficiently, a dedicated Back Office team must be set up in France. This team will manage the interfaces between the two teams, for instance, this team will manage the questions and answers process between the Front Office in Australia, composed by the ToT Team including the Technical Assistance and the ADA, and the design authority, which will remain in France.

A ratio of 1/3 to the total number of people in the permanent ToT Team and TA is required.

### 6.1.7 Rule 7 (ToT) – DP4.3 Production Expert Ratio

For DP4.3 Detailed Production Engineering, the ratio is 1 Expert per speciality (Hull & Structure, Piping & HVAC, Mechanic, Electricity, Light Materials).

One third of this team needs to be (M+E). Only the Naval Group Australia M Level people will perform OJT in France.

### 6.1.8 Assumption 1 (Program Execution and Human Resource Input) – Attrition

To account for attrition, the following attrition ratios need to be further applied to the roadmaps:

- the proposed ratio for Australians relocating to France for training (level M) is 20%. This takes into account family issues (sickness, family not settling in, etc.) and people not suited to the design activities (either people not passing the final exam or people not satisfied by the positions);
- the proposed ratio for Australians trained in Australia (levels S and A) is 20%. This takes into account that not all trainees will pass the final exam and that these people will probably be younger and will be more likely to change jobs if they do not like what they do; and
- the proposed ratio for the French relocating to Australia is 10%. This takes into account only family and health issues, as these people will know the work.

It is noted that these ratios will need to be monitored throughout the phases. It is also considered that the ADA Engineers feedback will provide valuable evidence to be able to update these assumptions.

The mechanism to update these ratios, if the attrition rate is higher, will be to increase the required number of Australian people that will be recruited in the earliest batch possible (for France and Australia). If it is identified that the real attrition rate is lower, the last cohort(s) will be adjusted.

For the purpose of this report, the attrition ratios are only applied to the costing section. All other graphs do not consider attrition, and present only the required number of people to perform the design activities.





### 6.1.9 Assumption 2 (Program Execution and Human Resource Input) – Location of the Design Teams

The following major assumptions deal with the geographical organisation of the whole design team. The specific aspects of this assumption are broken into three being essential, nice to have and opportunities:

- the following assumptions are considered essential. Without them, the data presented in this document are invalid, i.e. additional resources would be required to manage the interfaces between locations (as well as constraints on the infrastructure, ICT and human resourcing management) and impacts on the schedule are foreseen:
  - co localisation of detailed design arrangement and General Production engineering;
  - co localisation of Detailed production engineering and production;
  - co localisation of “Proxindus” and production; and
  - functional studies: the physical integration team has to be collocated with the arrangement.
- the following assumptions improve the efficiency of the whole process. However these options are “nice to have” and are not “road blocks”:
  - co localisation of detailed design arrangement and detailed production engineering;
  - co localisation of all design teams; and
  - co localisation of General Production engineering and production.
- the final assumptions are also “nice to have” but their consequences on the global efficiency of the design team are minimal. They are opportunities as they would allow for more flexibility within the location of each team (with some small decreases in efficiencies):
  - functional studies (not related to physical integration) may not be collocated with arrangement studies. If they are not collocated, there is an impact on the overall efficiency of the team, but it is feasible; and
  - transverse studies do not have to be collocated with arrangement studies.

s47, s47C, s47G

### 6.1.10 Assumption 3 (Program Execution and Human Resource Input) – Locations for DP4

s47, s47C, s47G



s47C



#### 6.1.11 Assumption 4 (Program Execution) – Schedule

The analysis **s47, s47C, s47G** is completed without changing the schedule. When a risk to the schedule is identified a risk mitigation action is proposed.

### 6.2 Options for DP4

#### 6.2.1 General Comments about DP4

s47, s47C, s47G

6.2.1.1



### 6.2.1.2 Physical integration of the Combat System

The physical integration of the combat system is managed through two kinds of activities:

- a technical management team, which manages the overall schedule and organisation to keep the drum beat for the exchange of data between the CSI and the PSI; and
- a dedicated technical team, which is in charge of the physical integration.

This second team works closely with the arrangement designers to ensure that the design takes into account the physical integration requirements.

s47, s47C, s47G

### 6.2.1.3 Arrangement Studies

The DP4.1 sub phase requires experienced submarine arrangement designers who do not currently exist in Australia. The required specific skills and experiences do not exist in other industries, even in surface naval combatants.

This is due to the high density and to the specific technologies required in a submarine.

The required skills are different for a DP3 or a DP4 phase, so people trained during the DP3 will still need to be trained to be competent to perform the activities required in DP4. This experience cannot be provided through training alone, the previous experience of a design phase is required, for at least for a percentage of the team as defined in Rule 3 of Section 6.1.3.

If this experience cannot be provided beforehand, then the number of Naval Group technical assistance has to be increased, as described in Rule 4 of Section 6.1.4.

### 6.2.1.4 Structural Studies

All structural related design studies are planned to be finished at the end of DP4.1.

s47, s47C, s47G





### 6.2.1.5 Detailed Production Engineering

In each scenario, detailed production engineering is supposed to be undertaken in the same location as where the manufacturing occurs. Whatever the option, the training and OJT scenario will be the same including a first session in France based on the HQTS and then training sessions in Australia.

This part of the ToT is not considered as a risk and was not considered in the analysis. The hours related to this however were considered in the cost and Australian Involvement sections of the report and the detailed roadmap will be provided in the next version of the document.

### 6.2.2 Geographical Breakdown Structure

To perform arrangement studies, the submarine is divided in geographical zones. These zones are studied according to the time requirements of the build strategy (the production pulls the design at this stage of the program). s47, s47C, s47G

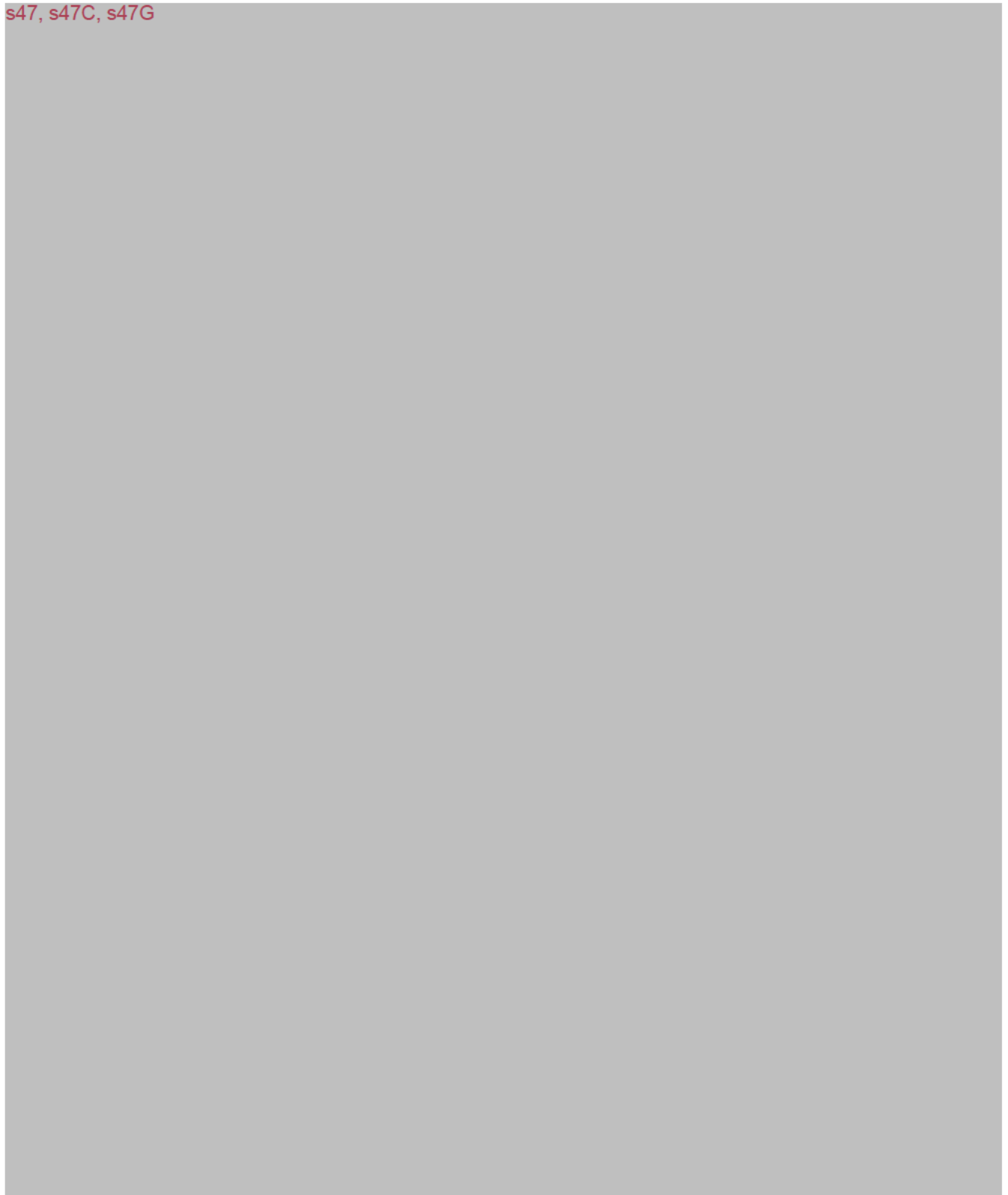
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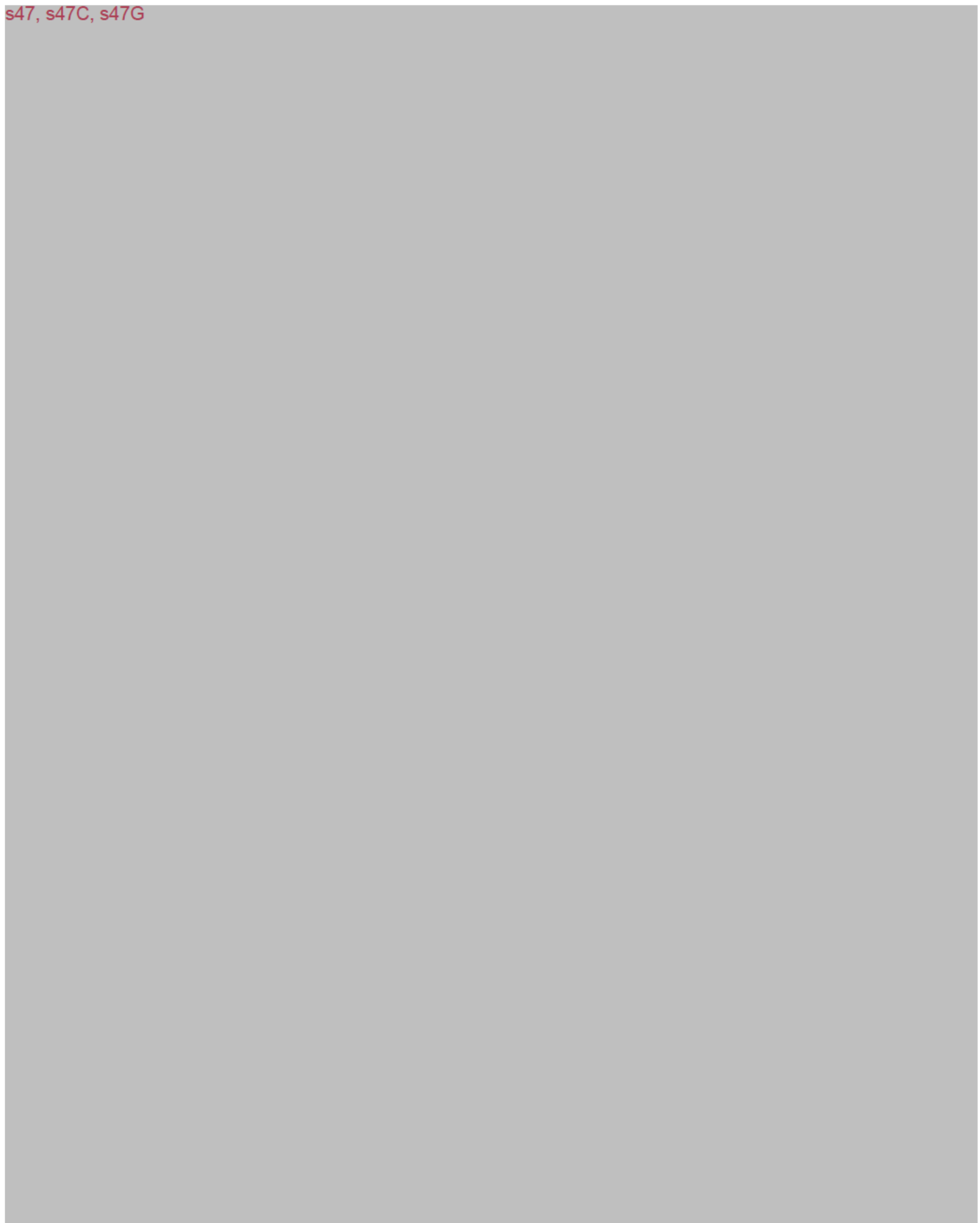


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### 6.3 Introduction to the Analysis of the Options

The analysis of each option will follow an iterative approach. This document considers five input streams, which are ToT, ICT, Program Execution and Human Resource Input, Australian Involvement and Cost. The approach of this document is to individually assess each of these streams against each option, to determine the feasibility. If all five streams are considered as feasible, the option is considered for the Multi Criteria in Section 7, of which the results of this section will identify the recommended option. Figure 13 details this approach.

s47, s47C, s47G



*Figure 13. Assessment Approach*

The approaches of each assessment are identified in the following sections.

### 6.3.1 ToT – Assessment Criteria Definition

The ToT stream is assessed using the following criteria:

- Criteria 1: Training – Evaluate the capability of the Australian Detail Design Arrangement workforce to reach the level M following the training course and the OJT. This criteria requires 1 year of OJT undertaken in DP4 as per requirement expressed in ToT Rule 1 for S.A.M.E Levels (See section 6.1.1);
- Criteria 2: OJT – The ratio between trainees and the trainers. This needs to be considered because if the ratio is too high, there is a risk that the OJT training will not be effective (as the trainers will be focussing on the real work), or the opposite (the real work will not be done as the trainers are too focused on the trainees); and
- Criteria 3: Technical Data Package (TDP) – The amount of documents which need to be prepared to describe the trade and the methods. This is assessed against the scope of each option and then the maturity.

The scoring method against these criteria is as follows:

- 1 = Most difficult (Highest level of risk);
- 3 = Hard;
- 6 = Medium;
- 9 = Easiest (Least level of risk); and
- 0 = Not feasible.

### 6.3.2 ICT – Assessment Criteria Definition

The capacity of ICT to handle the different work-sharing scenarios is driven by:

Business complexity drivers, highlighting how methods and tools should be adapted to cope with a more or less complex scheme of interactions between the different stakeholders. The business complexity drivers for the ICT stream are assessed using the following criteria:

- Criteria 1: Time interaction – manage the transfer of responsibility according to design maturity DP4.4 is shared between the French and the Australian teams;
- Criteria 2: Geography interaction – manage physical interfaces between adjacent zones;
- Criteria 3: Functional interaction – manage functional interfaces, esp. for transverse systems split in several arrangement zones; and
- Criteria 4: Skills interactions: manage concurrent activities on the same objects but with different point of view (ex: eBoM versus mBoM).

NB: all these interactions are exacerbated by the increasing number of generated data over time and the level of modification to cope with it.

The information system complexity drivers for the ICT stream are assessed using the following criteria:

- Criteria 5: Data synchronization stakes – required performance level of the IT solutions to propose efficient exchange mechanisms;
- Criteria 6: Data migration stakes – quantity of data to migrate versus time lapse to achieve it and associated risk of non-quality; and
- Criteria 7: IT Deployment stakes – capacity to master developments in terms of feasibility, cost and schedule.

The scoring method against these criteria is as follows:

- 1 = Most difficult (Highest level of risk);
- 3 = Hard;
- 6 = Medium;
- 9 = Best (Least level of risk); and
- 0 = Not feasible.



### 6.3.3 Program Execution and Human Resource Input – Assessment Criteria Definition

The Program Execution and Human Resource Input stream is assessed using the following criteria:

- Criteria 1: Availability of French Resources to perform and support the Activities both in France and in Australia ;
- Criteria 2: Availability of Australian Resources to perform the Activities both in France and in Australia including attrition risk;
- Criteria 3: Quality– Ability to perform the task efficiently and to ensure a high standard.

The scoring method against these criteria is as follows:

- 1 = Most difficult (Highest level of risk);
- 3 = Hard;
- 6 = Medium;
- 9 = Best (Least level of risk); and
- 0 = Not feasible.

For each criterion, it is not possible to have an identical level on the same line (i.e. no two options can have the same rating).

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s47, s47C, s47G



#### 6.3.4 Australian Involvement – Assessment Criteria Definition

The Australian Involvement Input considers that only one criterion exists:

- Criteria 1: Percentage of Hours by Australian – The percentage of hours indicates the exposure the Australians have had to DP4 activities and will directly correlate to the amount of skills transferred.

The scoring method against these criteria is as follows:

- 1 = Most work done by French (Highest level of risk);
- 3 = Balanced – French bias;
- 6 = Balanced – Australian bias;
- 9 = Most work done by Australians; and
- 0 = Not feasible.

For each criterion, it is not possible to have an identical level on the same line (i.e. no two options can have the same rating).

It is noted in the conclusion that this criteria does not assess the ability to maintain this workforce over the duration of the FSP (including batching)

#### 6.3.5 Cost – Assessment Criteria Definition

The initial cost estimate is based on the actual data of all expatriates (French and Australians) on the FSP program. For example if Engineer X moves from Australia to France (or vice versa), Naval Group can easily work out the total difference which includes the salary difference plus the agreed HR package plus all other associated costs (visa costs, social security costs, etc.).

It is noted that there are additional costs which are not included in this comparison (for example if two offices are required in Adelaide and another location), however this method is considered as a good way to approximately compare the cost magnitude of each option. It is





also noted that this cost only focuses on the cost for  
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The costing factors are defined as follows:

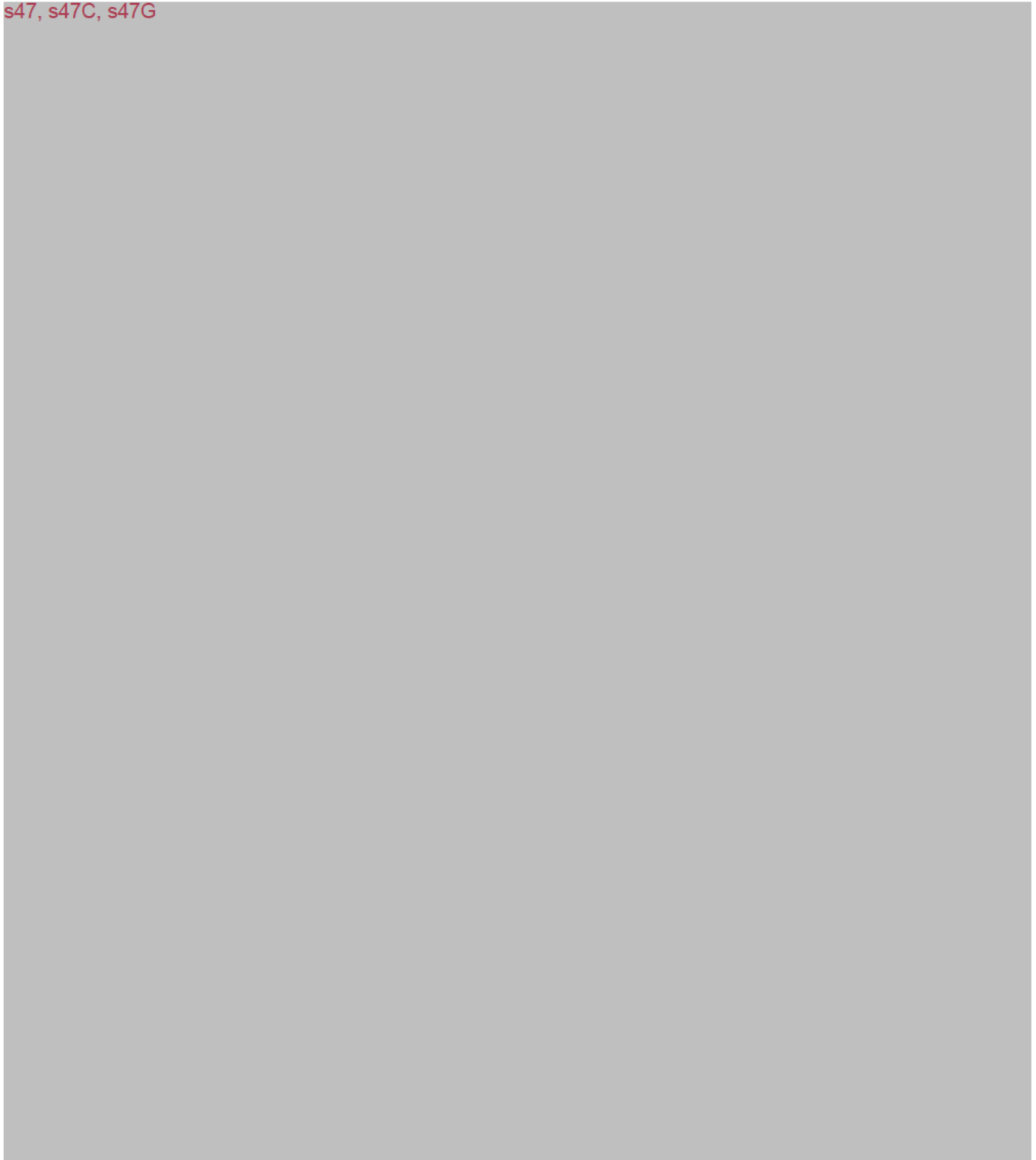
- Australian in Australia = 1.0 (baseline cost);
- Australian in France = 2.0 (approximate cost including relocation and expatriate entitlements);
- French in France = 0.8; and
- French in Australia = 2.1 (approximate cost including relocation and expatriate entitlements).

The cost is then defined as the percentage of hours (defined in the Australian Involvement Input), multiplied by the costing factor. The scoring method against these criteria is then as follows:

- 1 = Most expensive;
- 3 = Expensive;
- 6 = Cheap; and
- 9 = Cheapest.

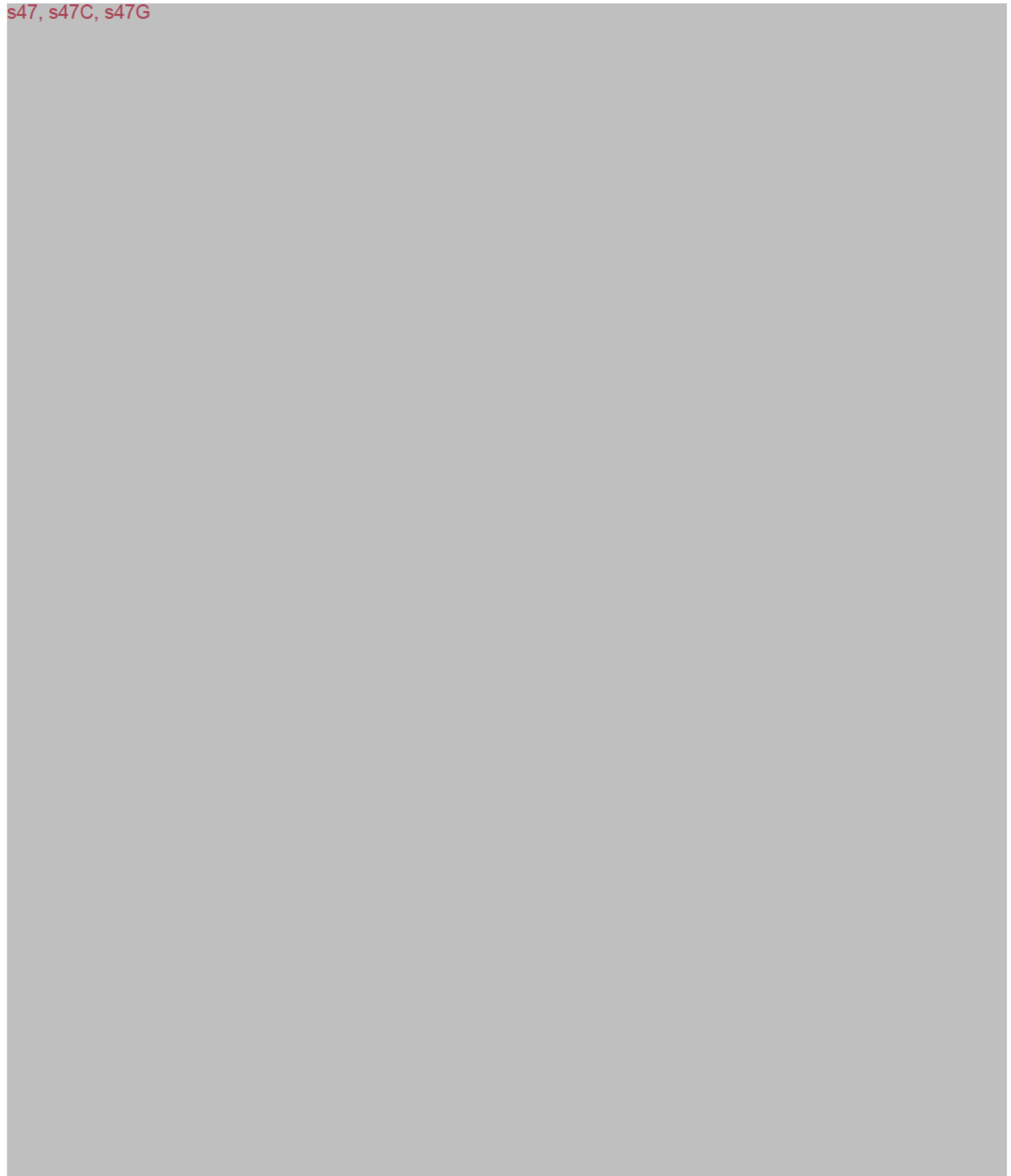


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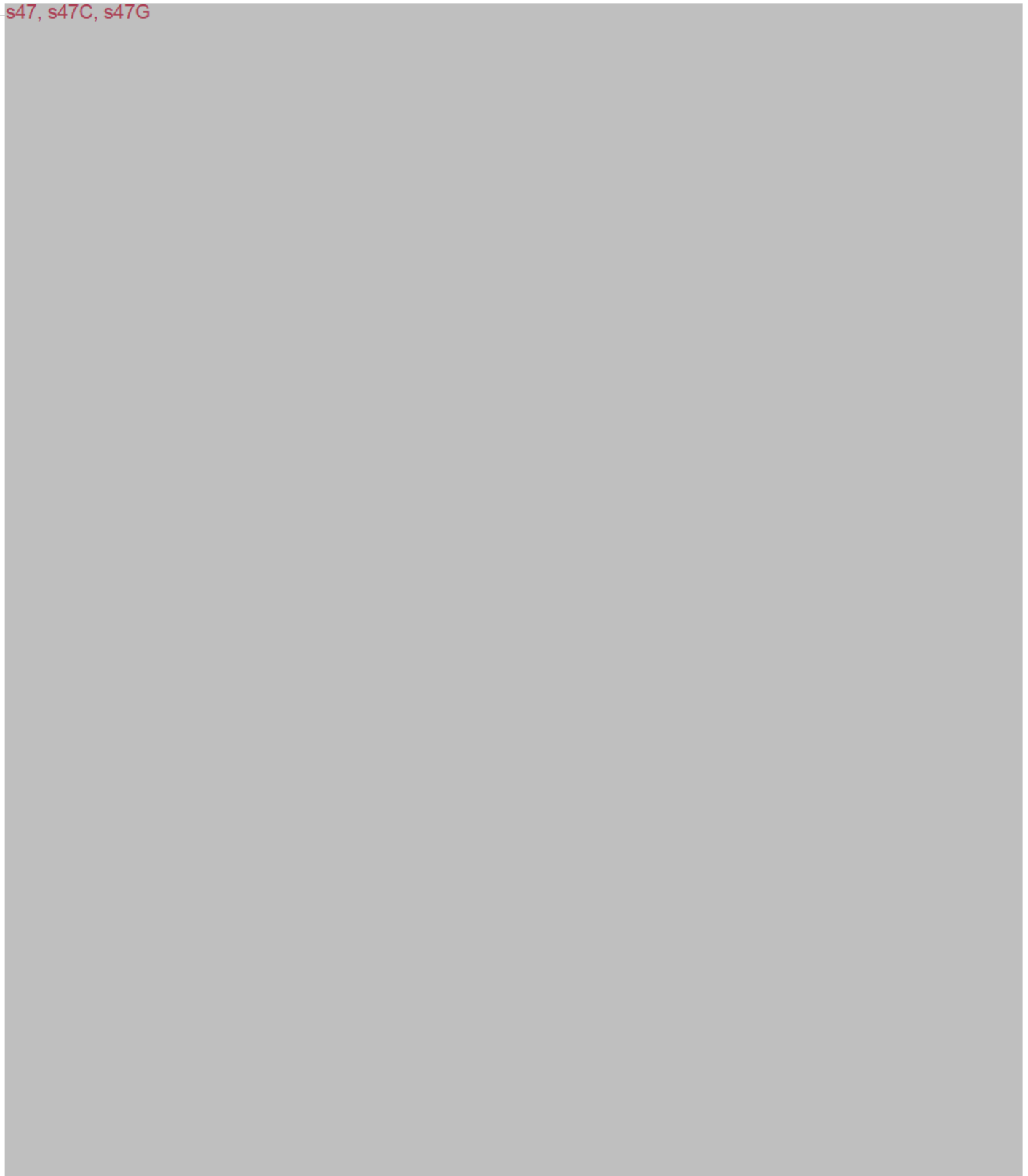


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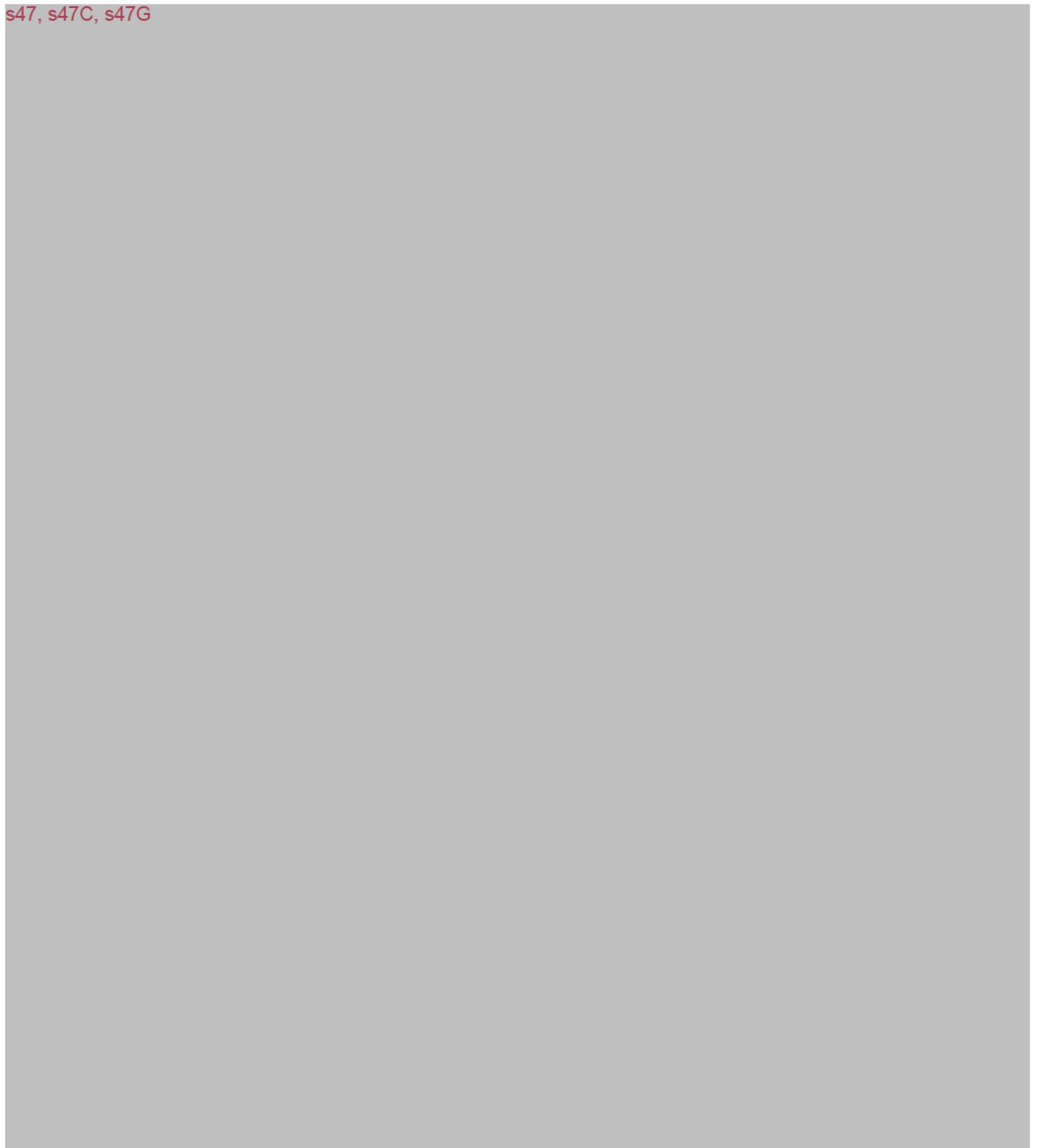


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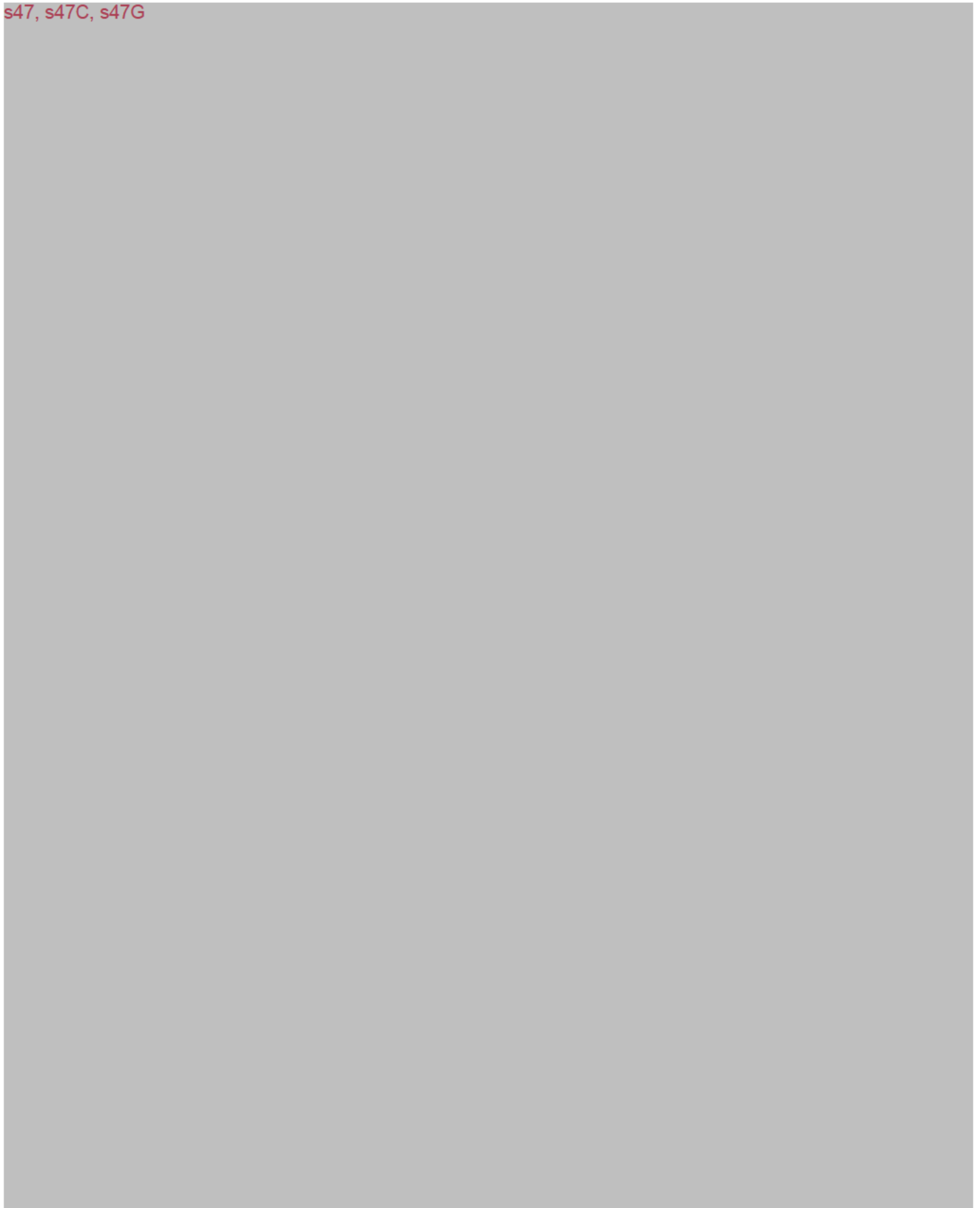


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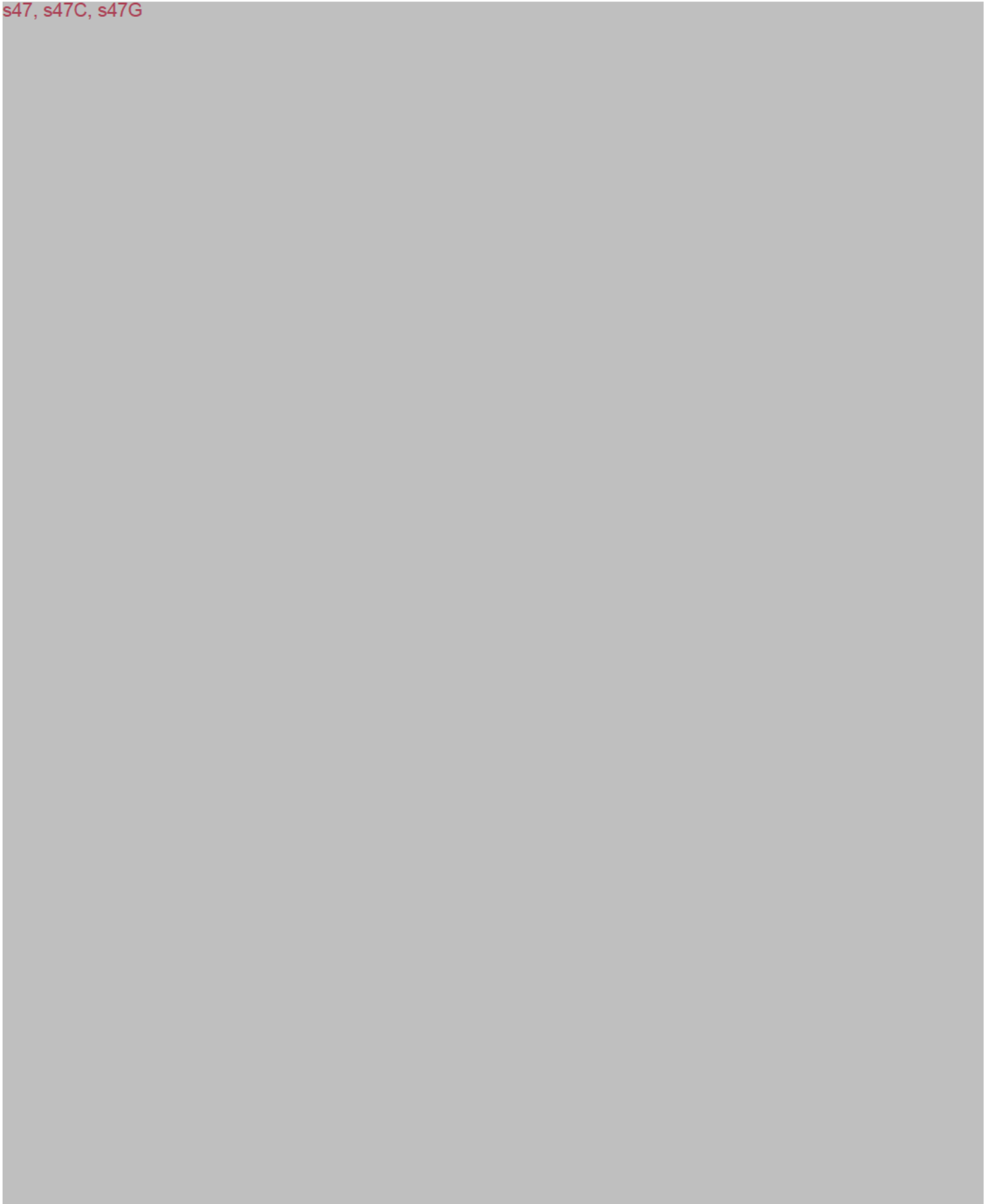


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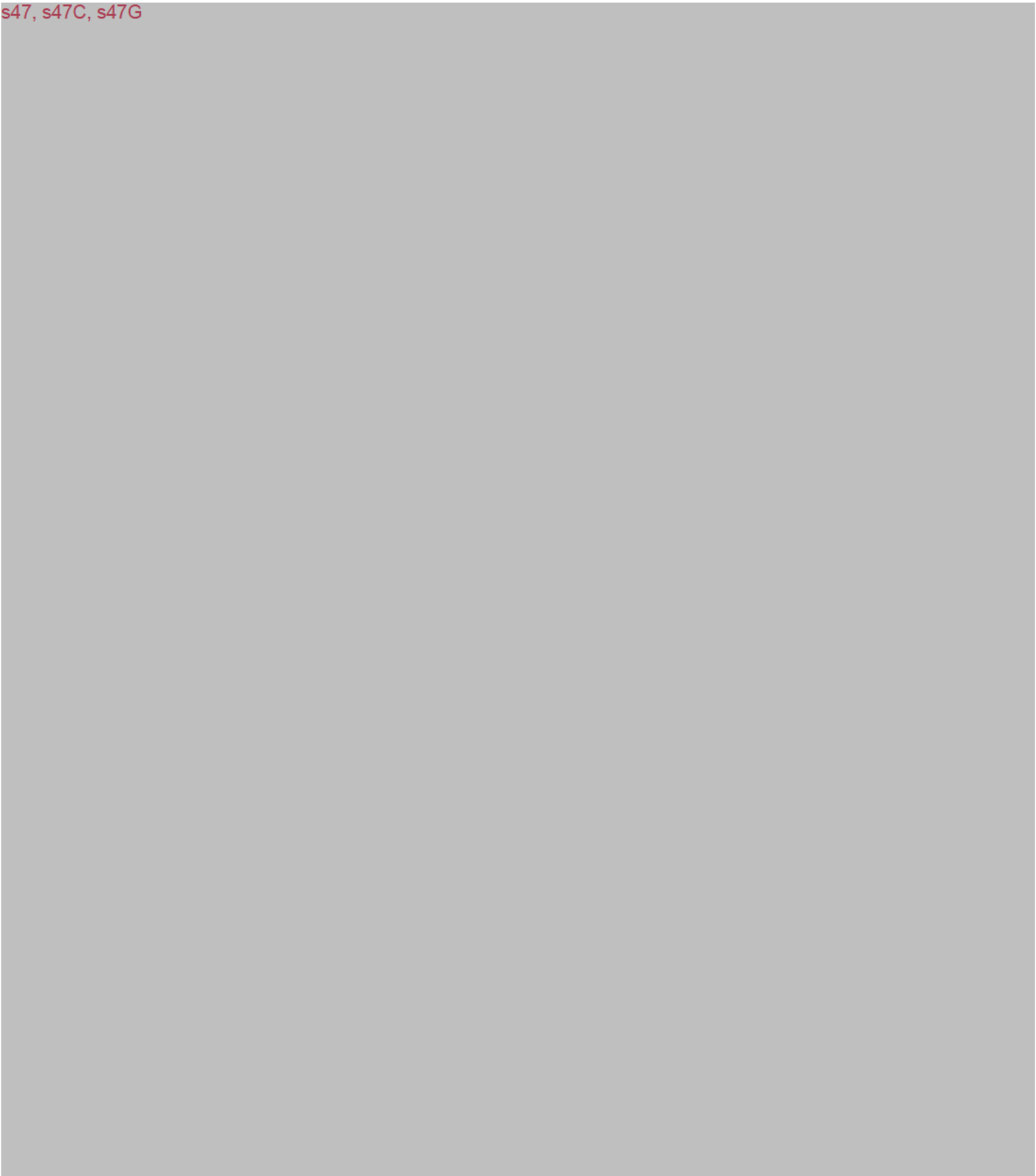
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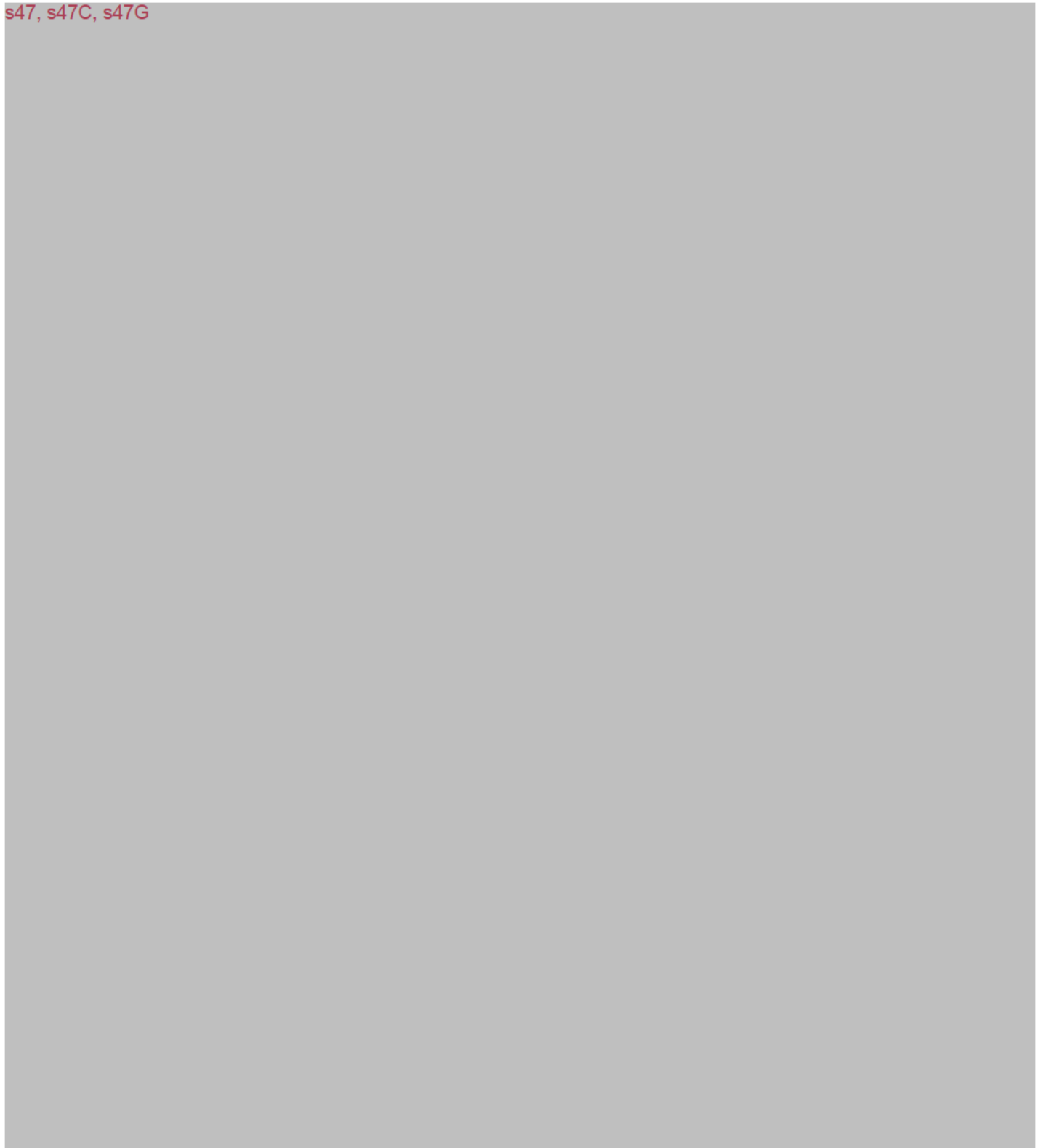


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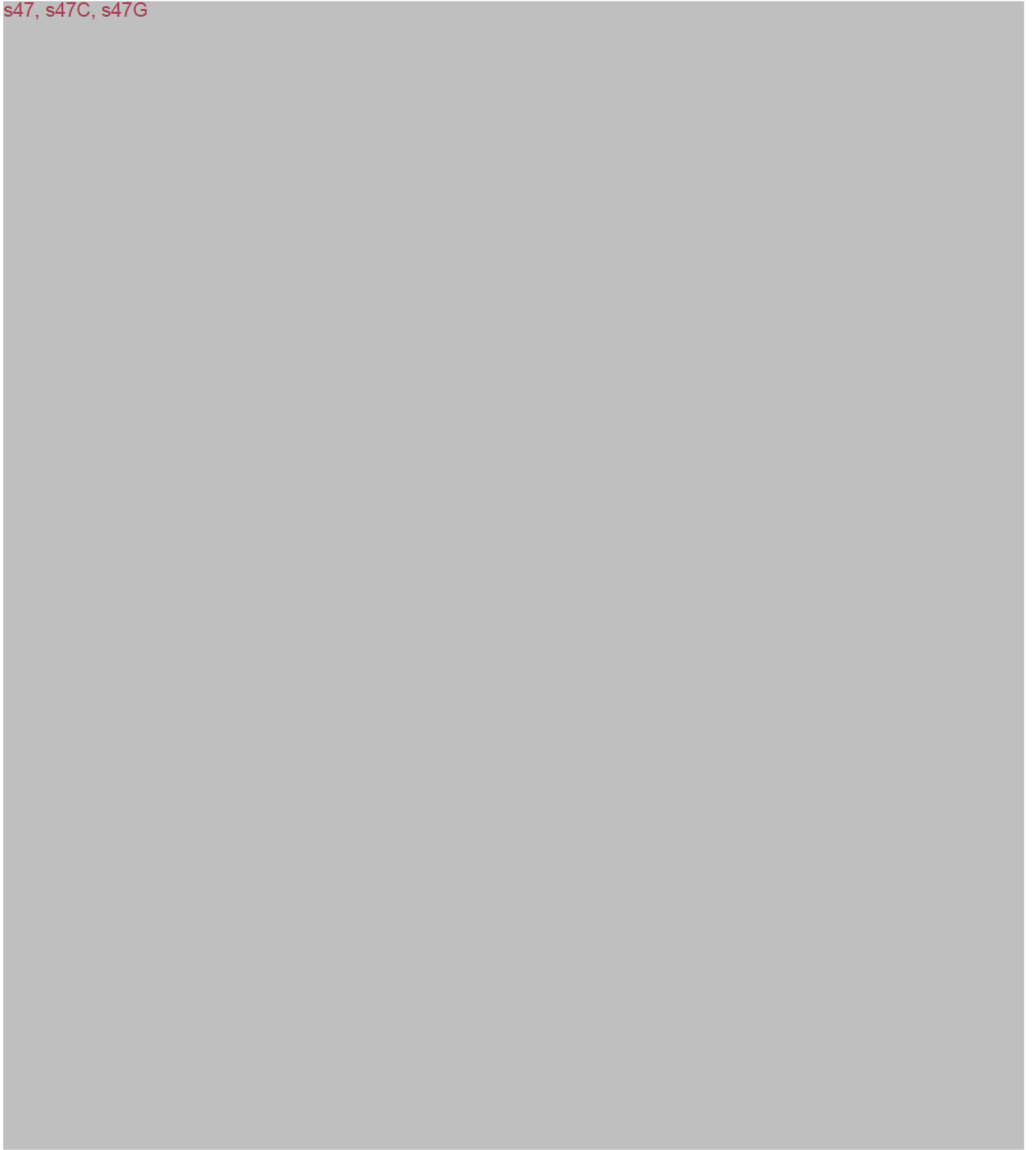


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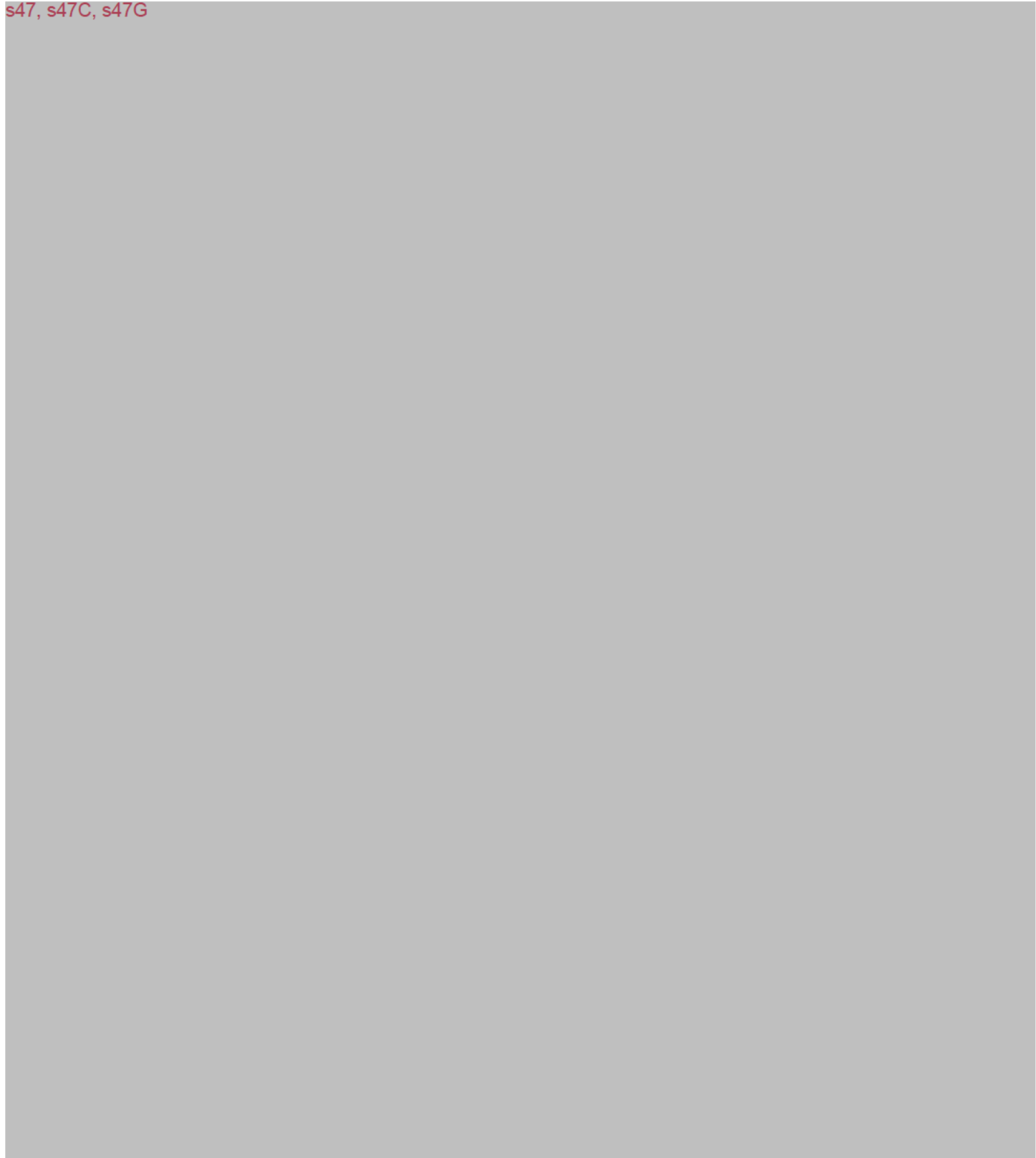


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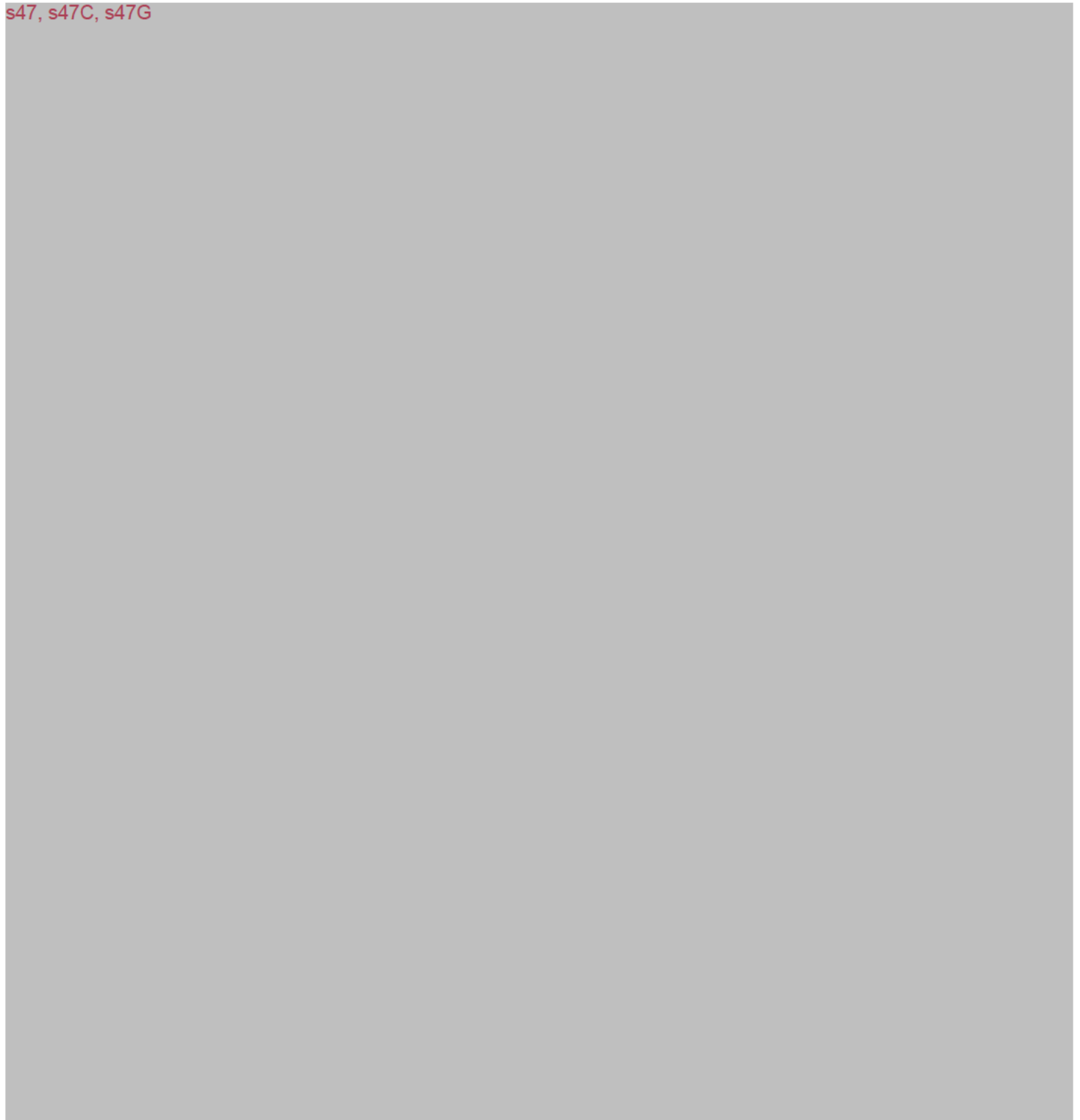


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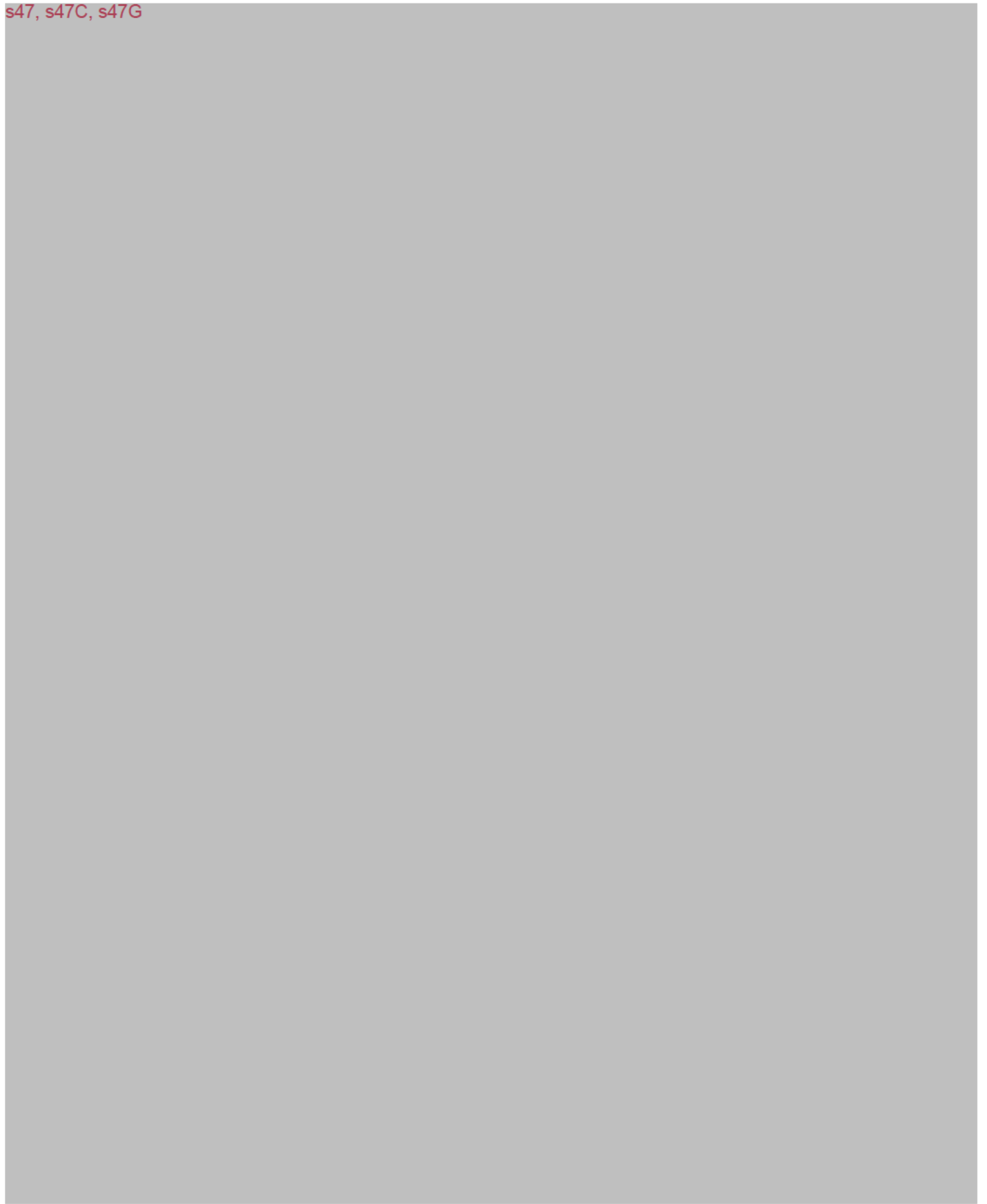
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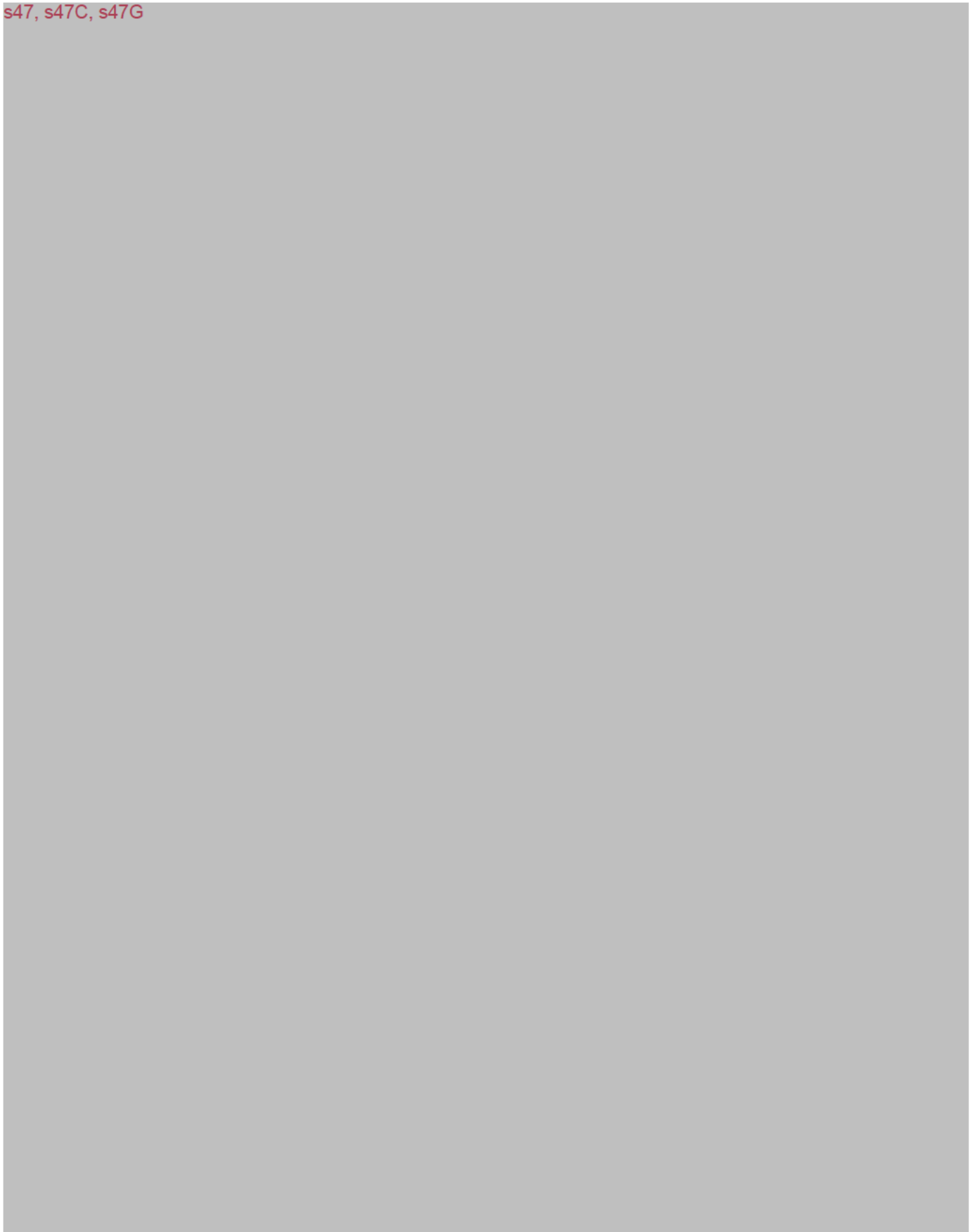


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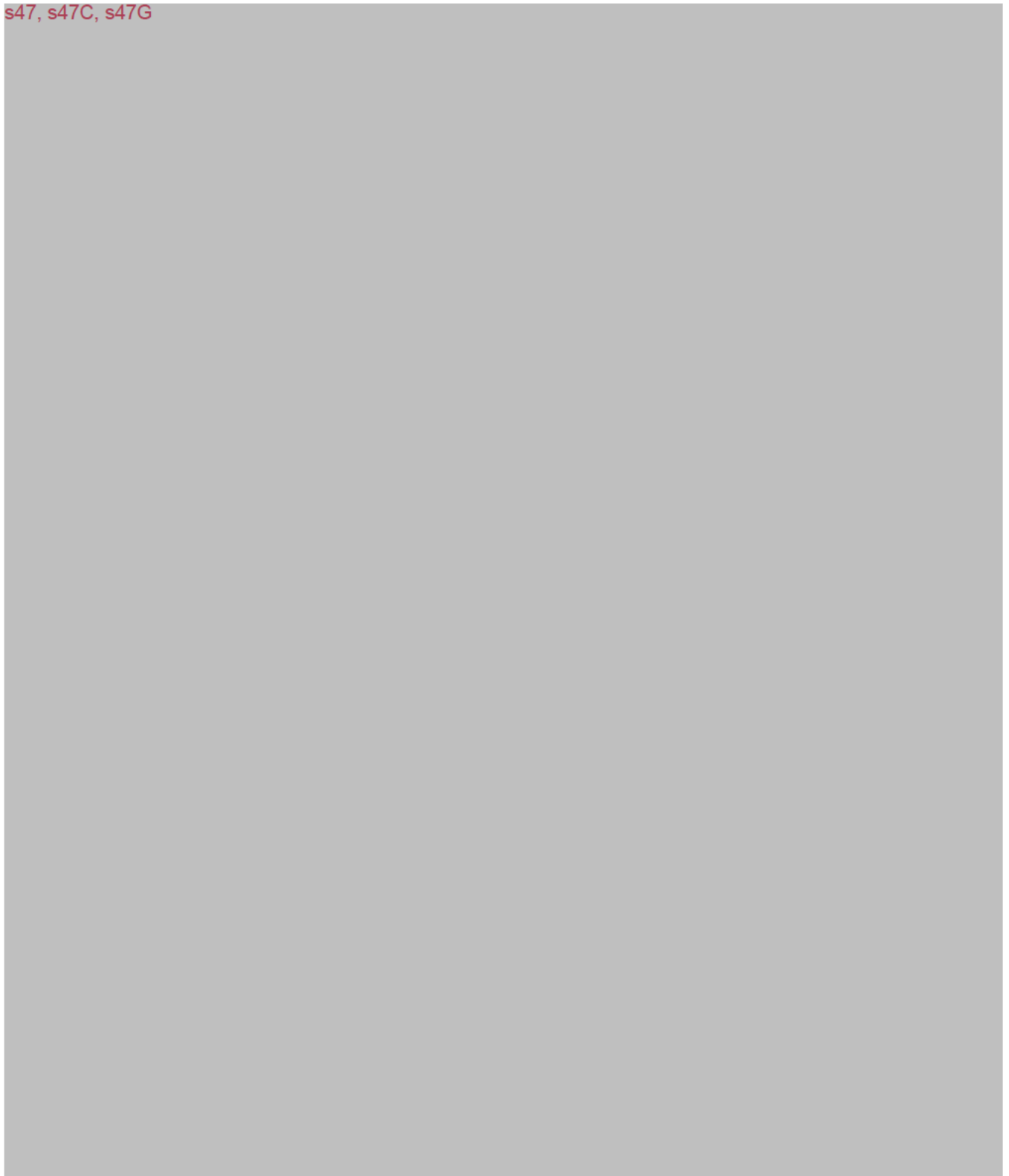


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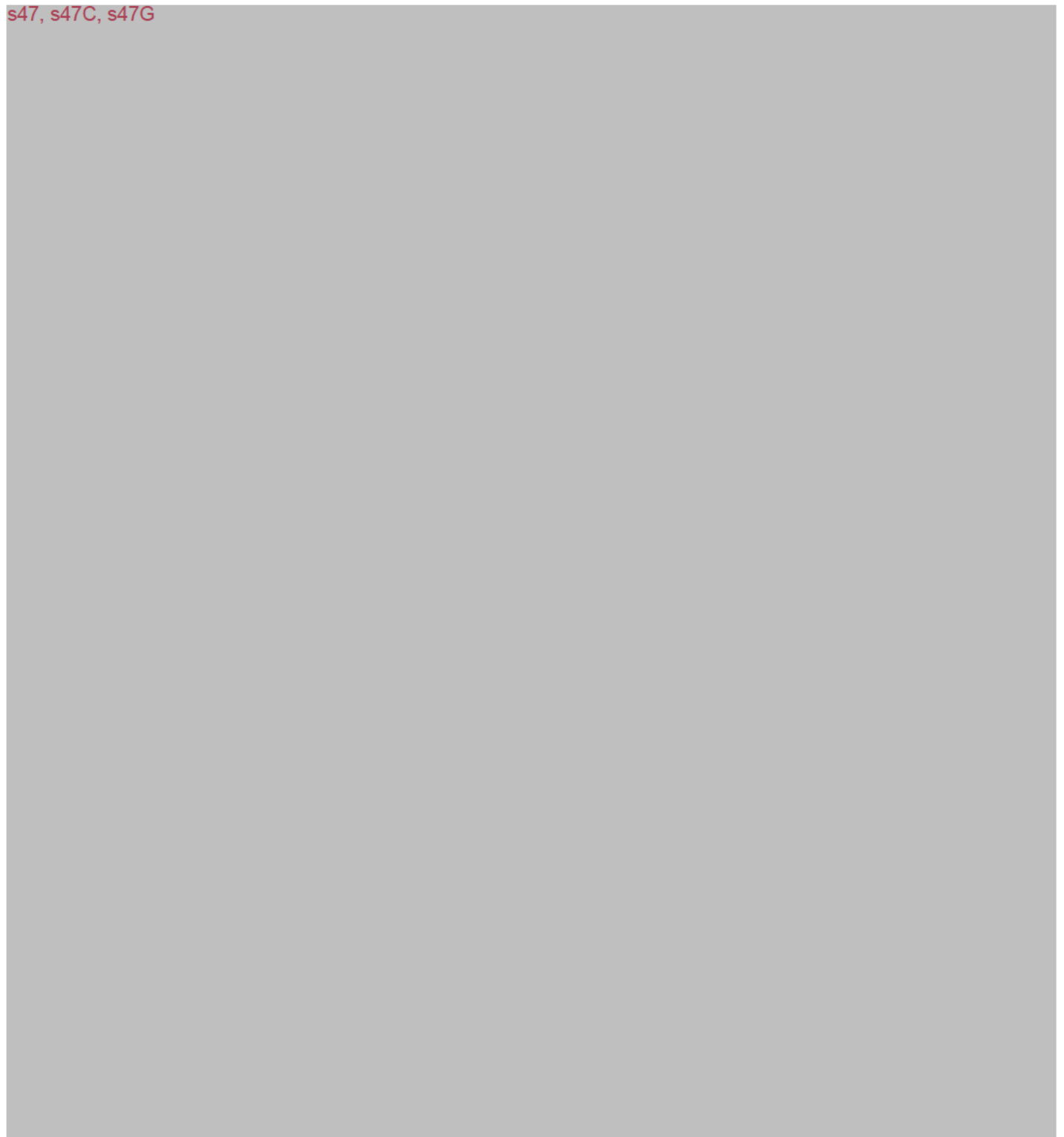


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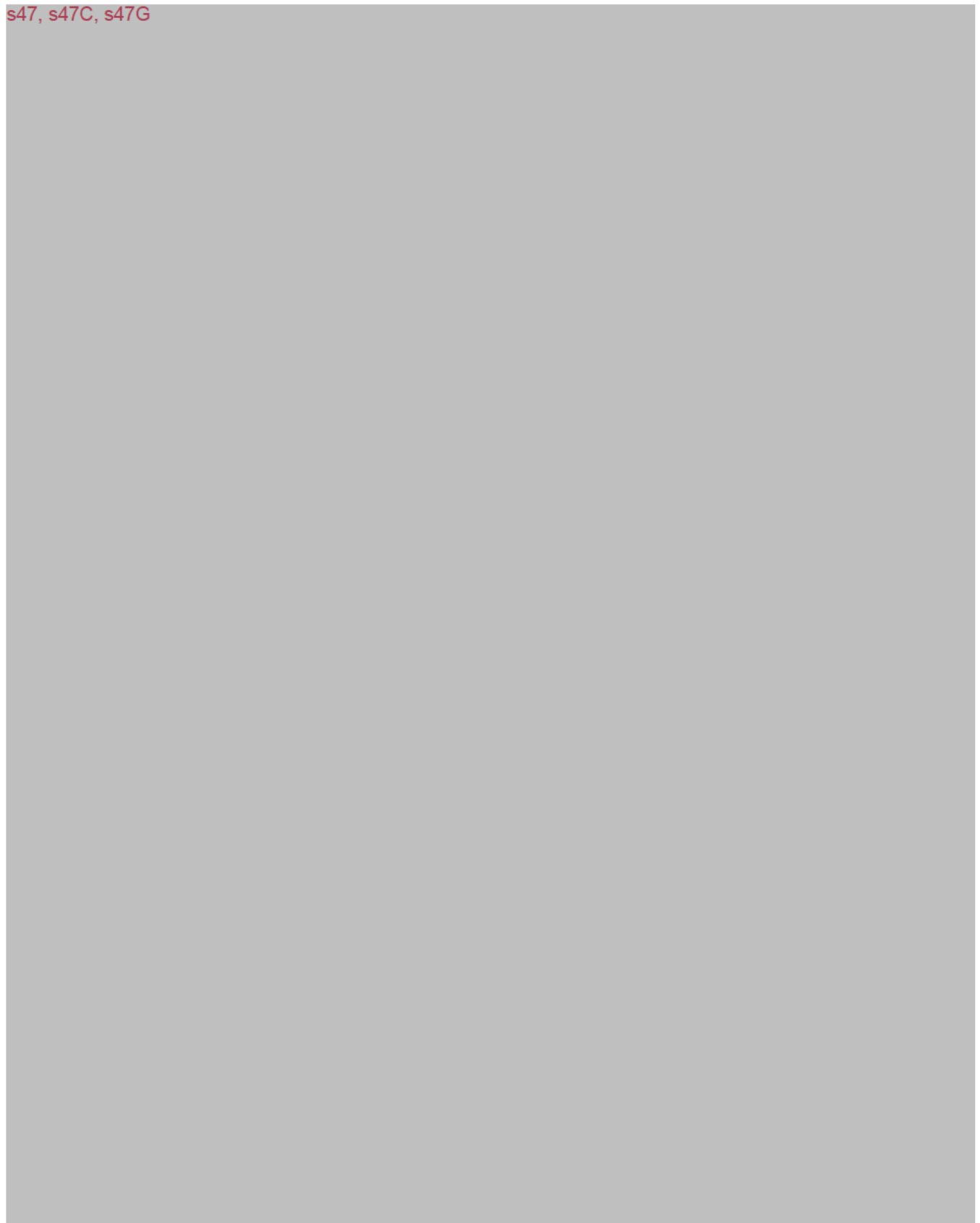


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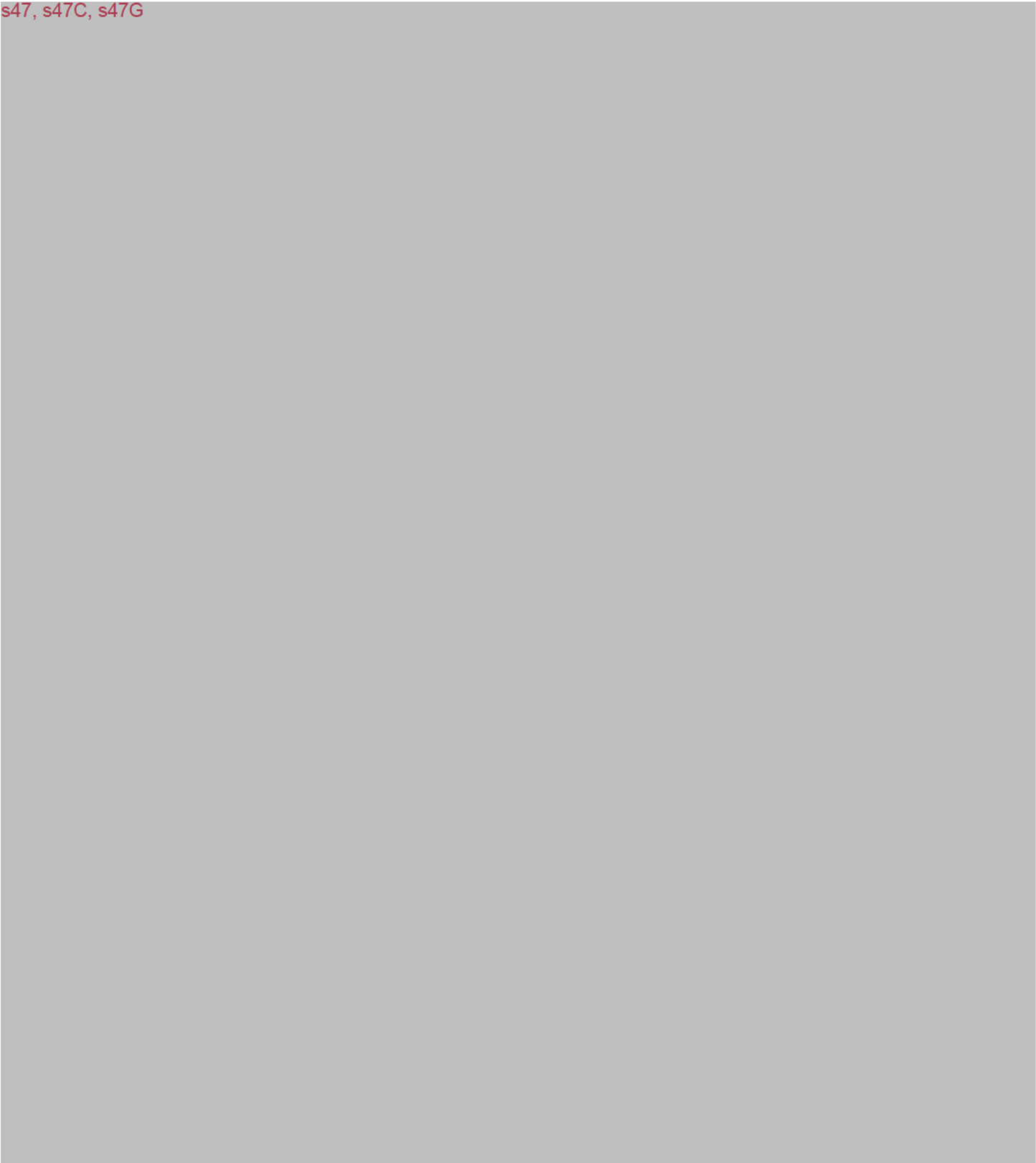


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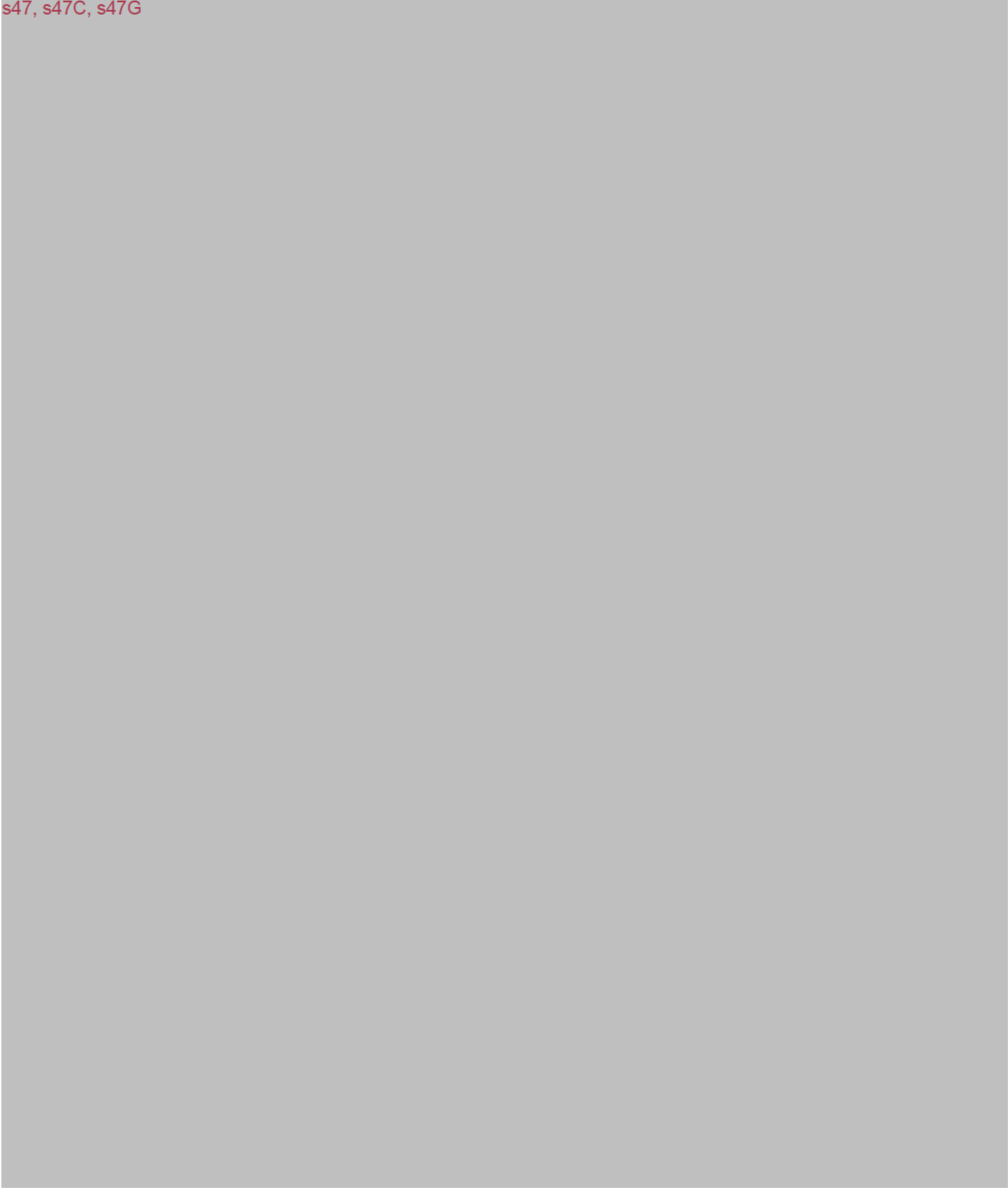


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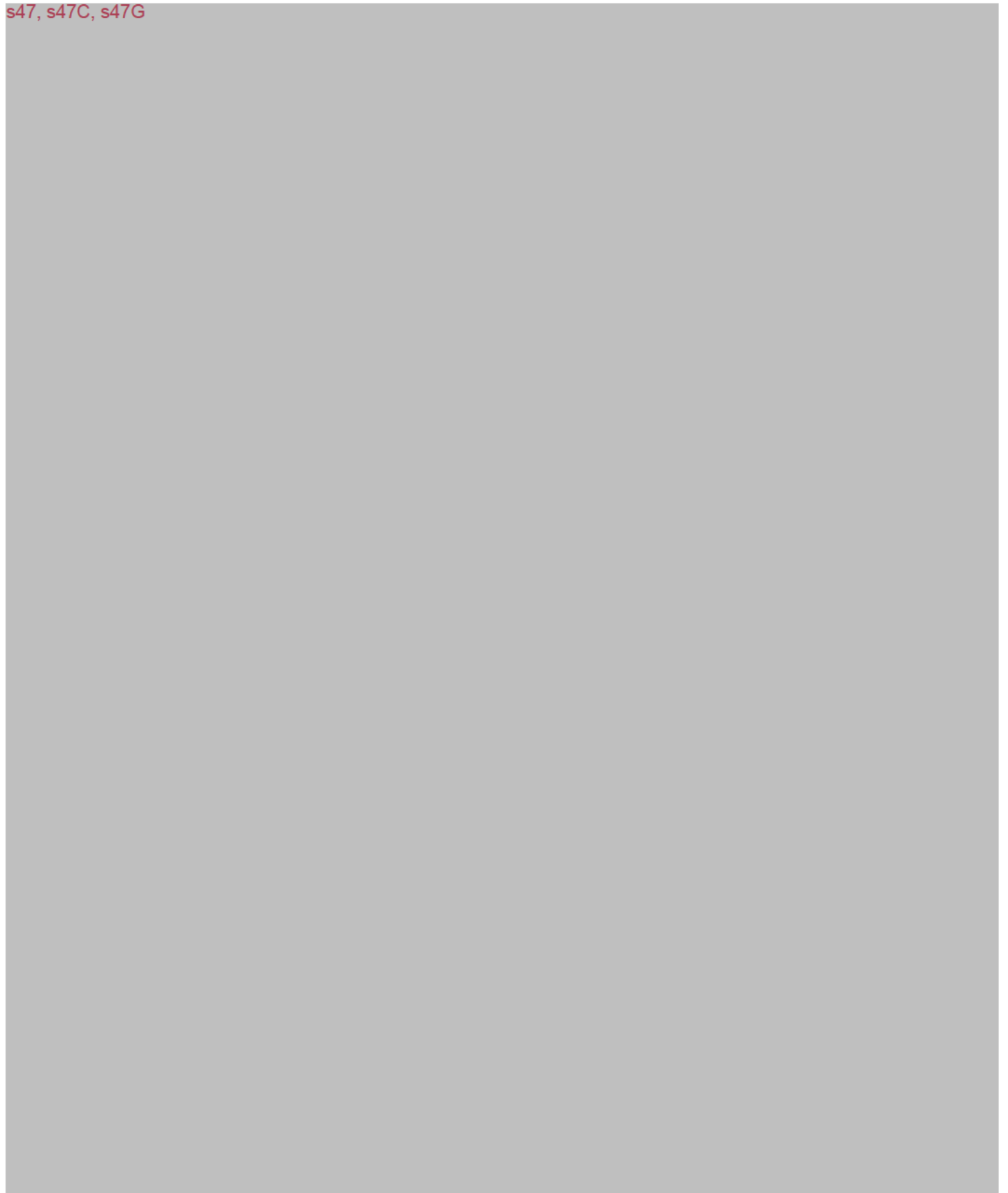


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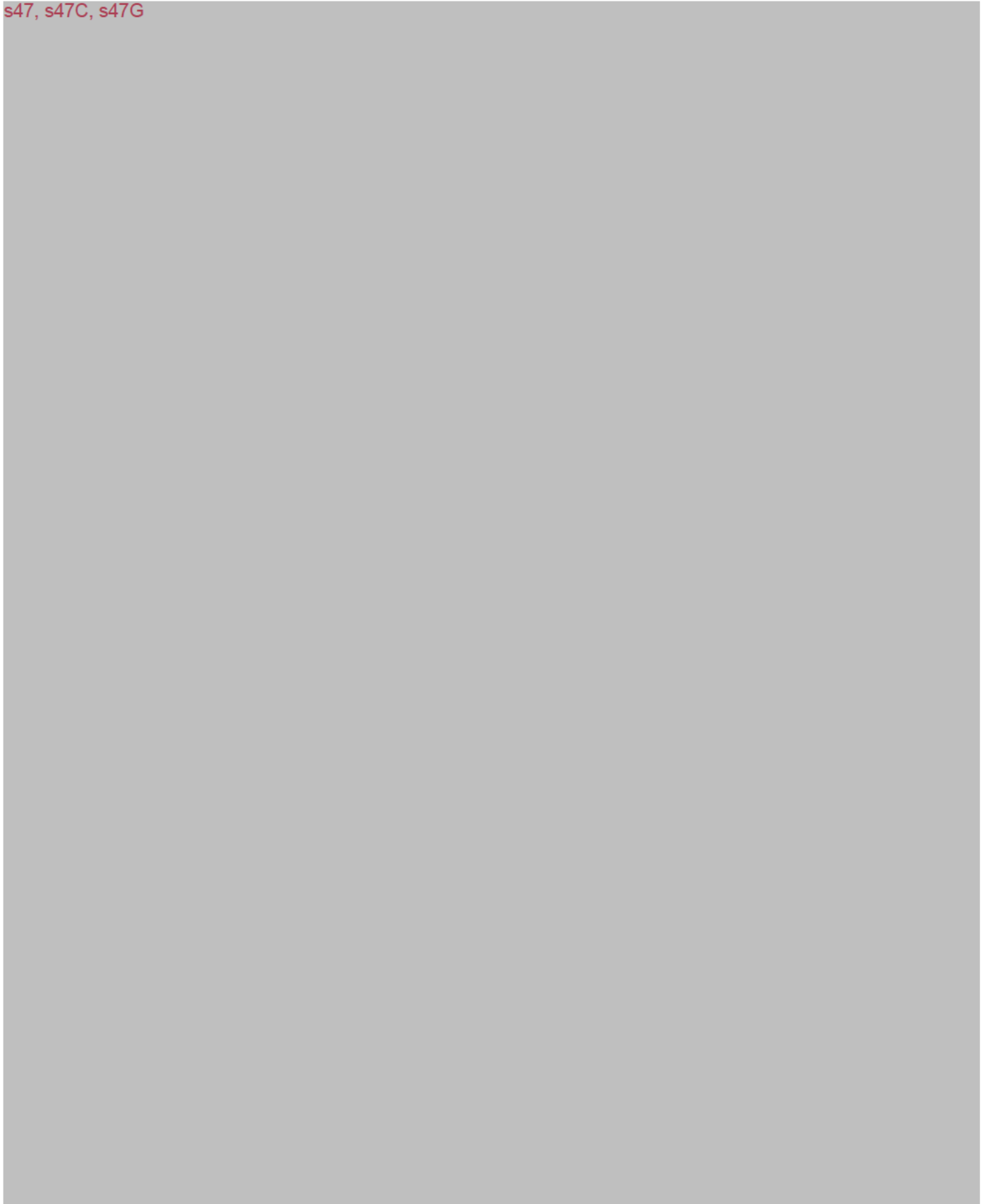


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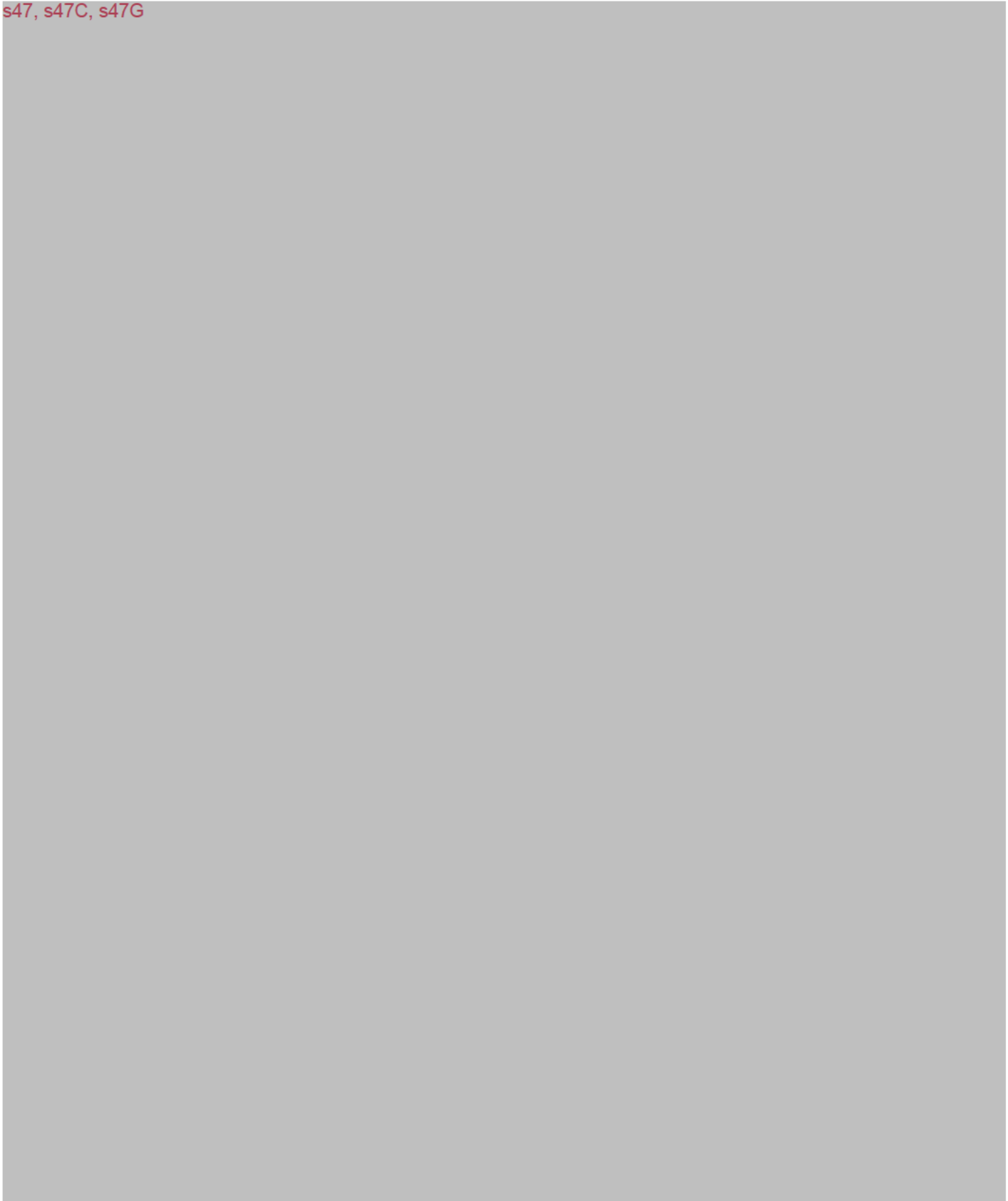


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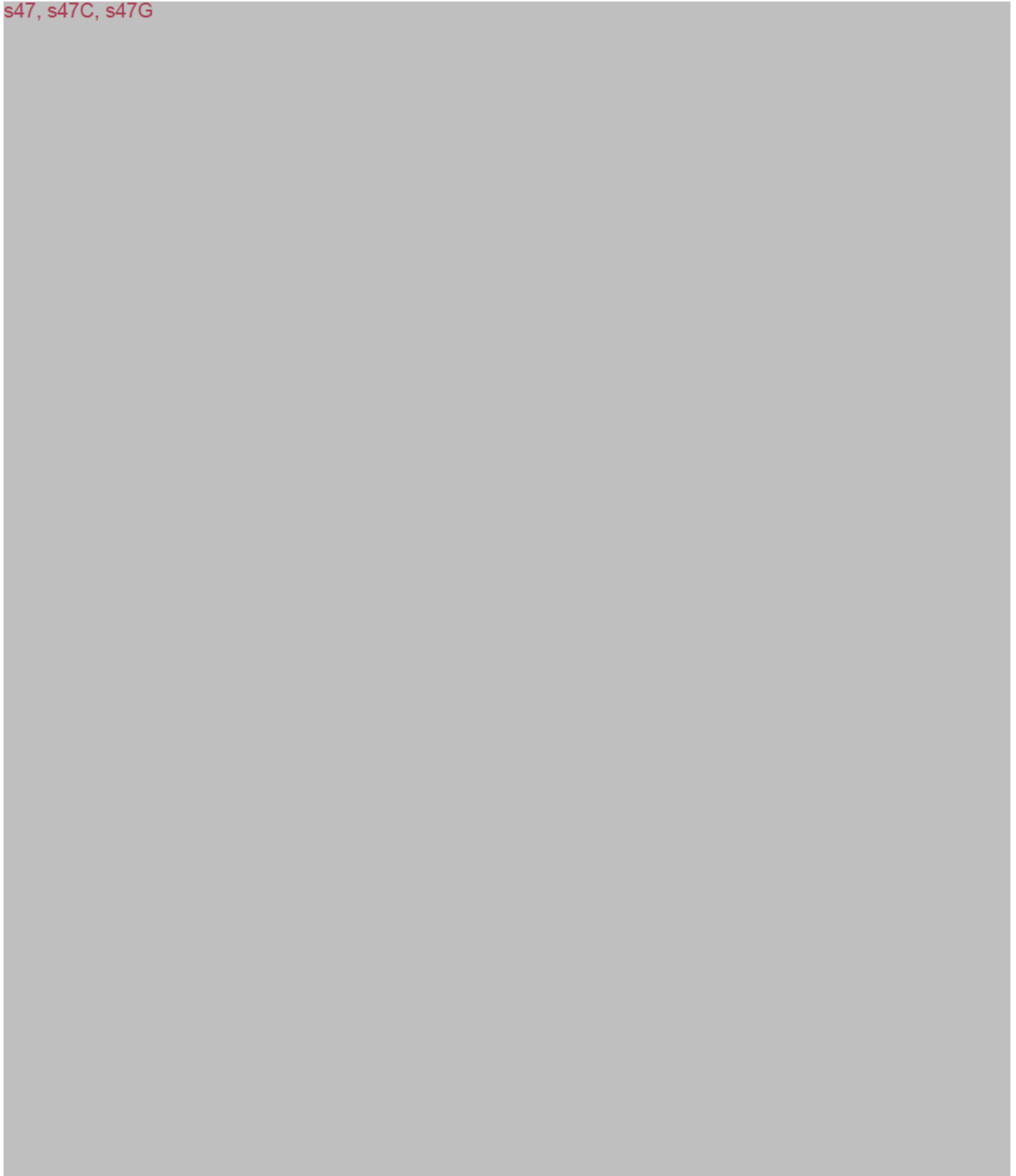


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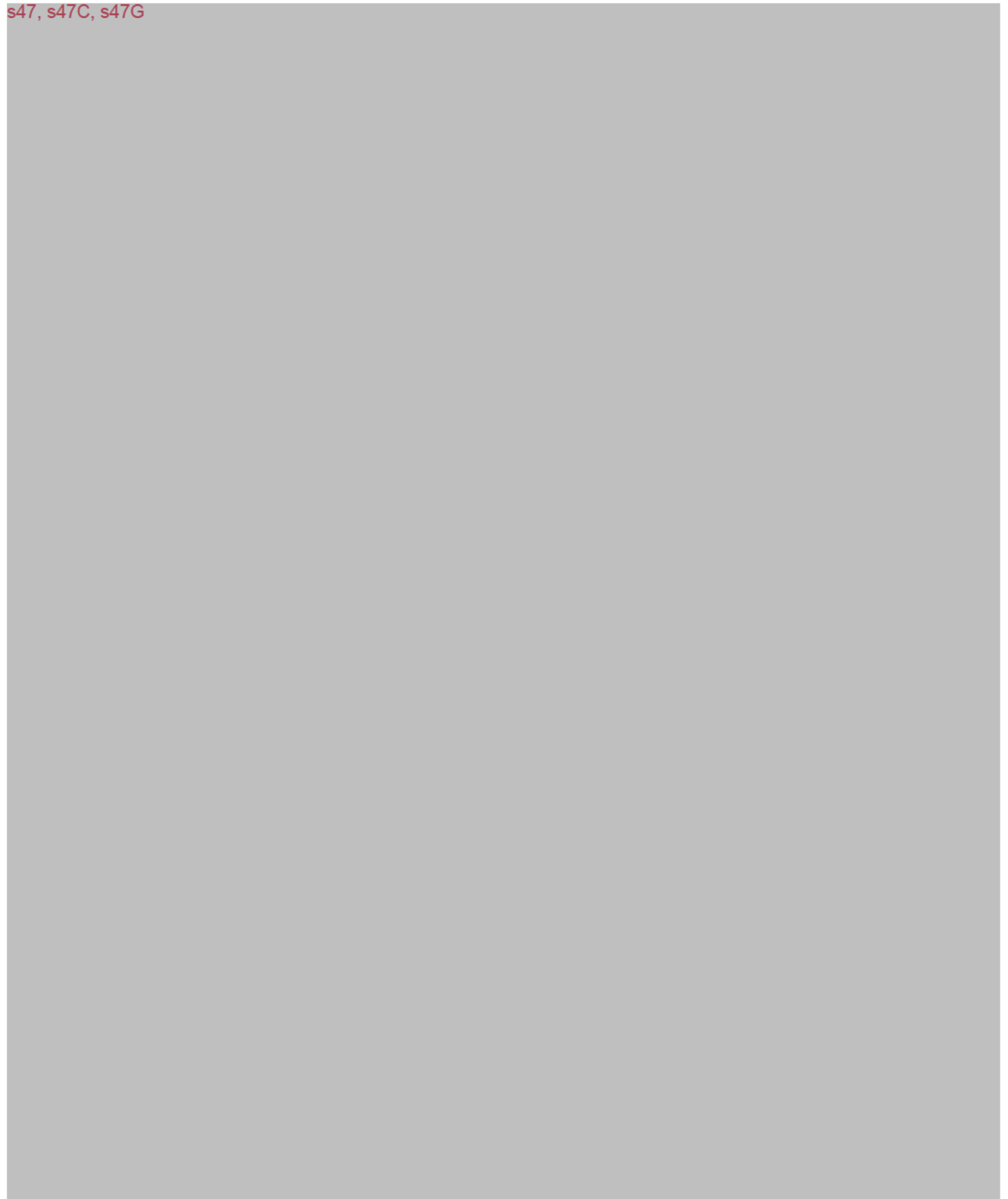


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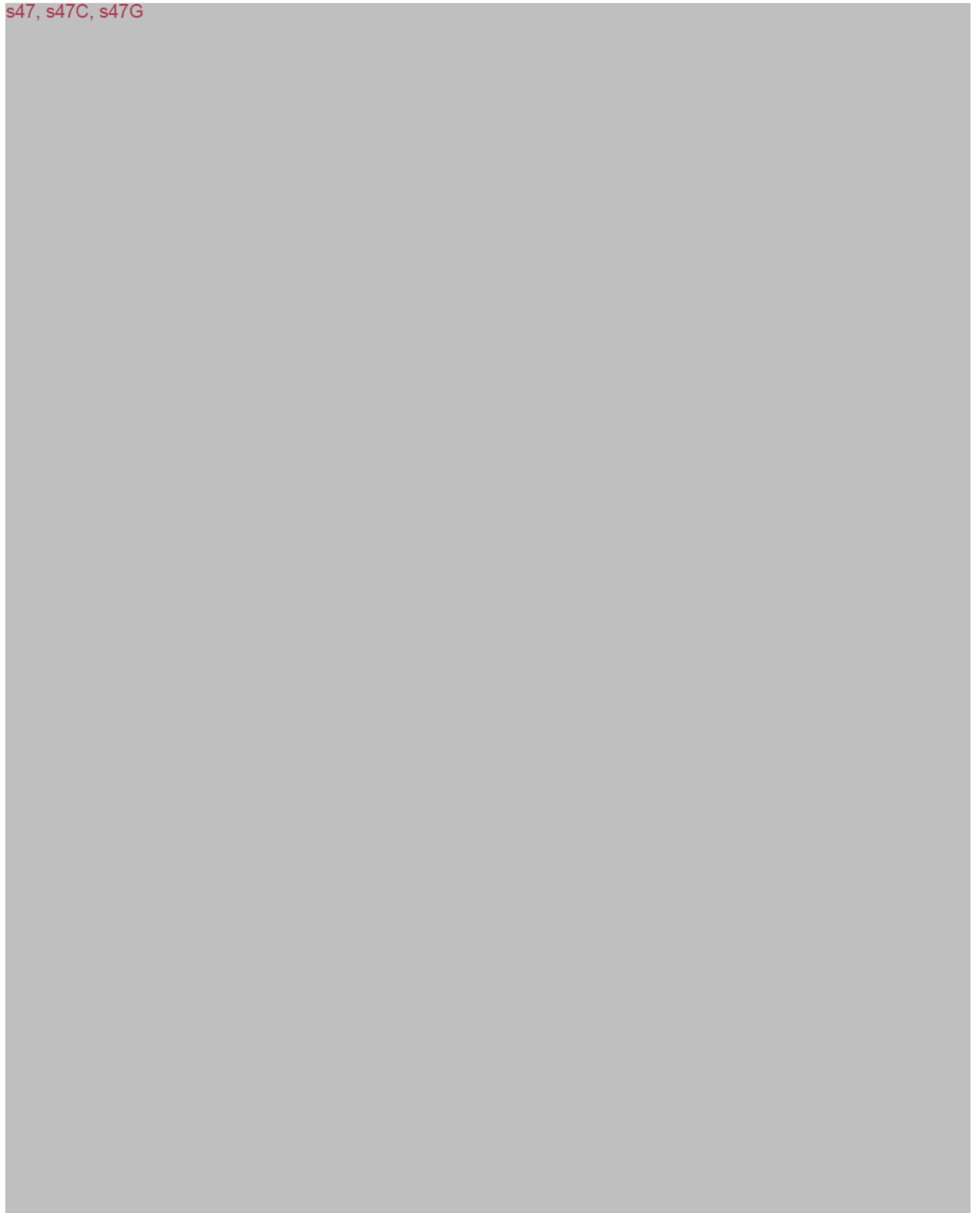


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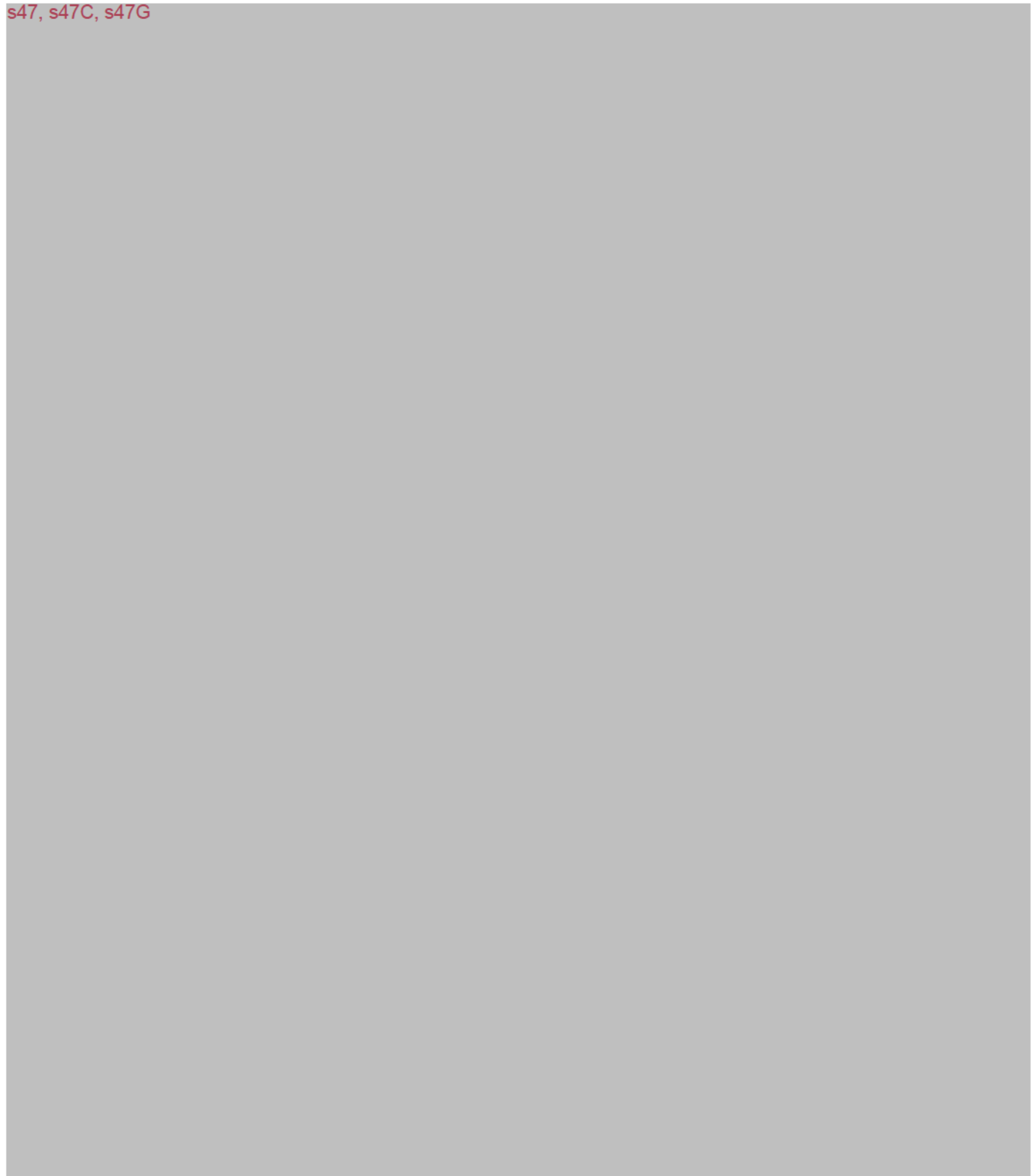


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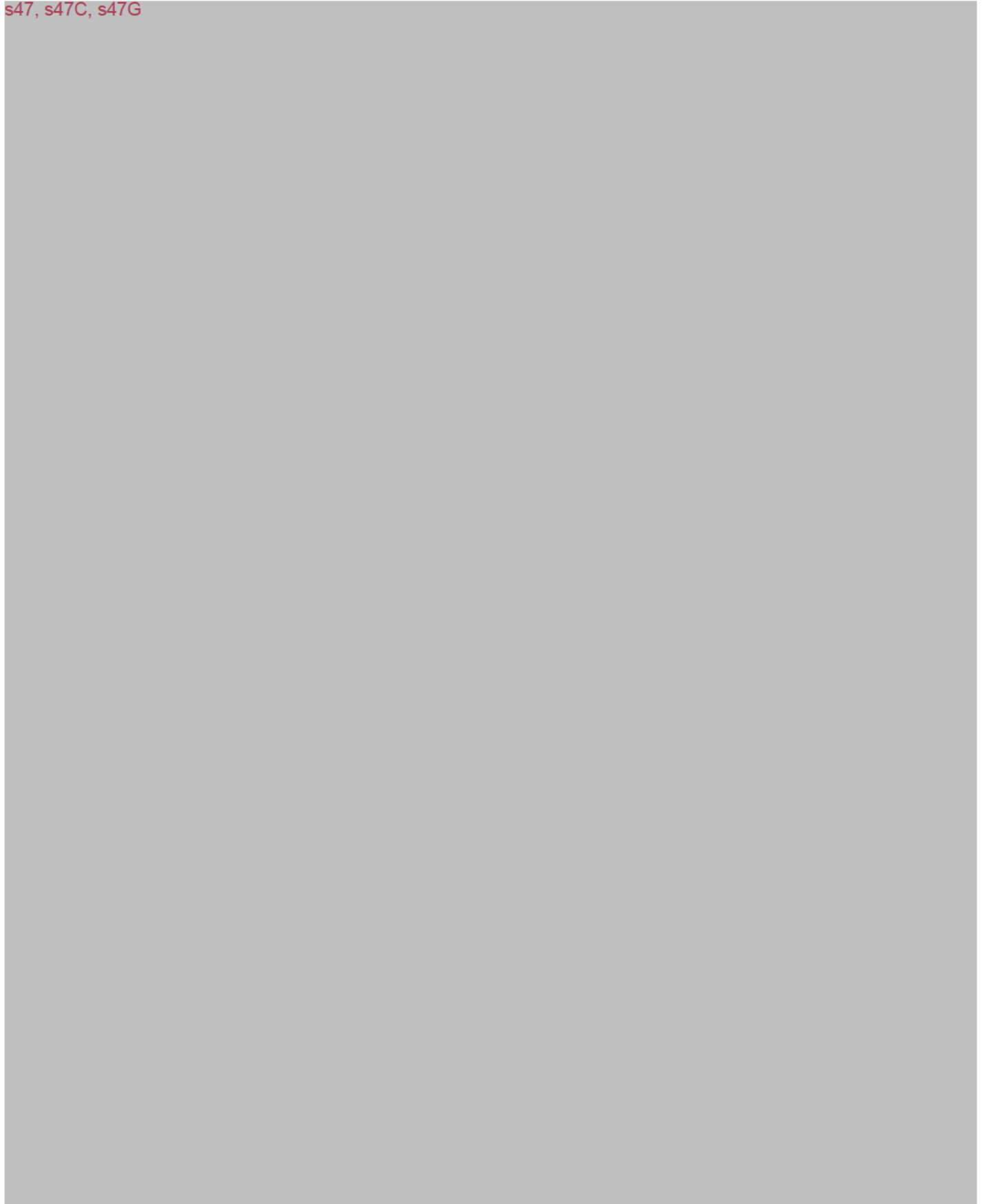


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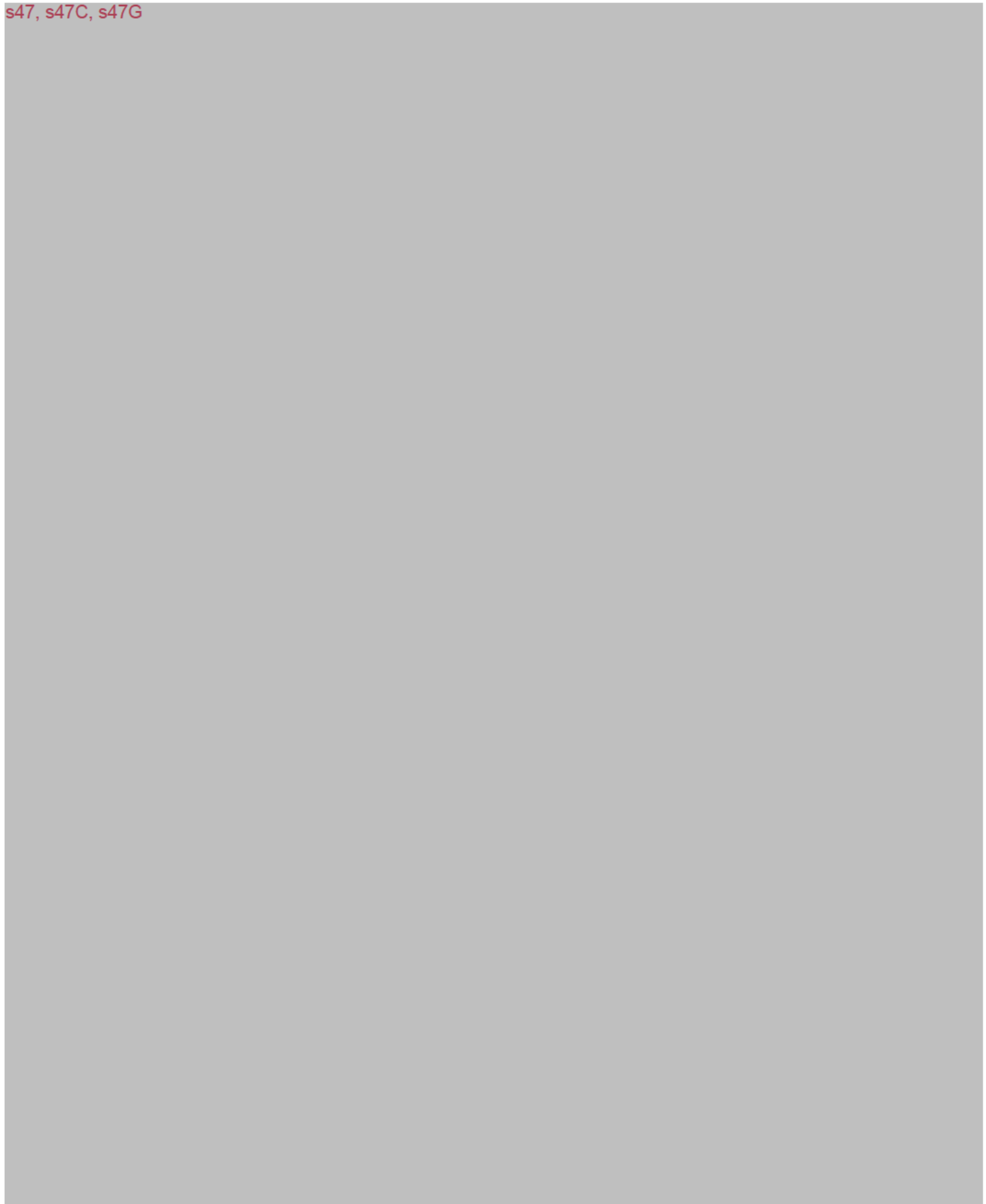


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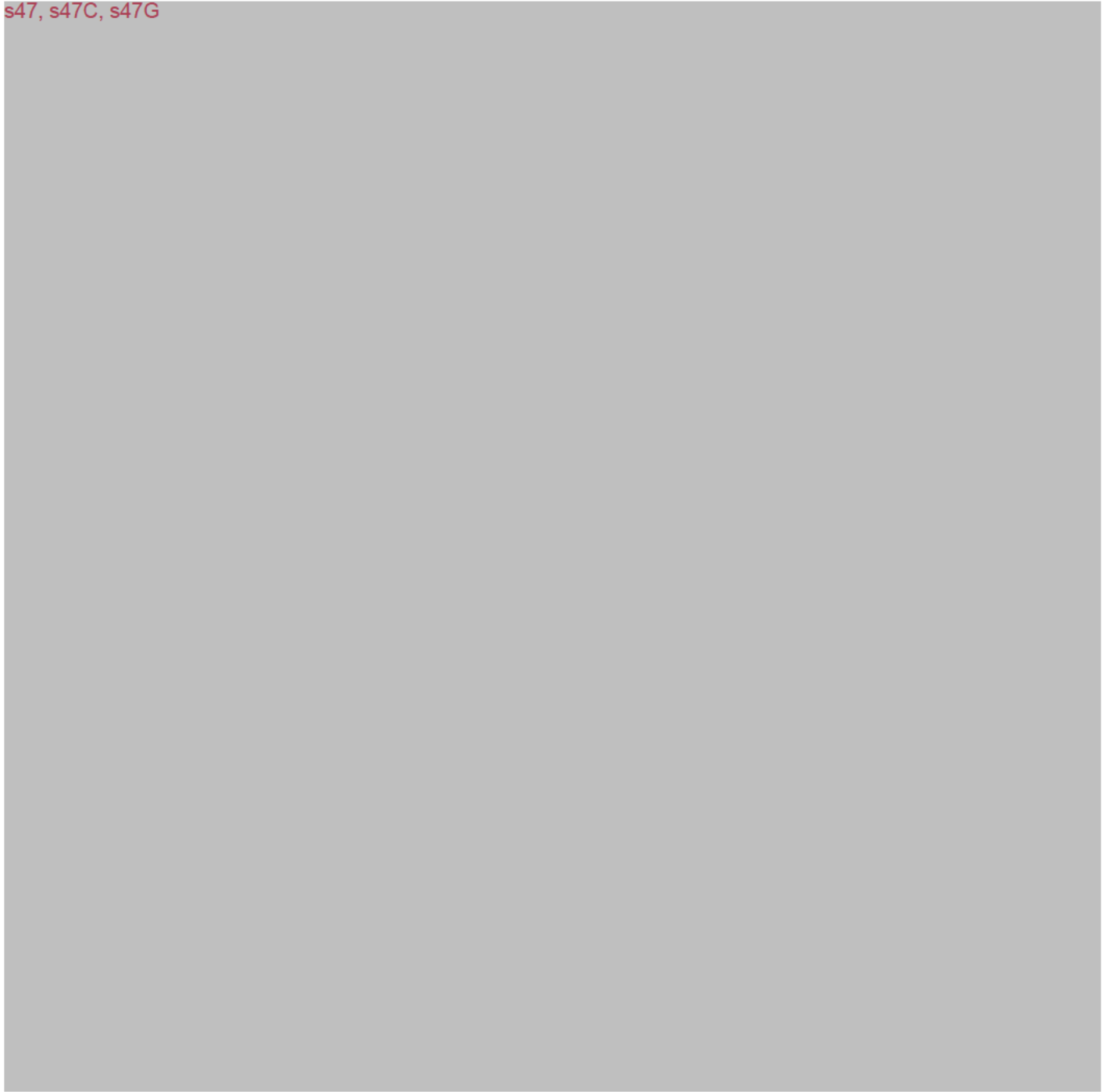


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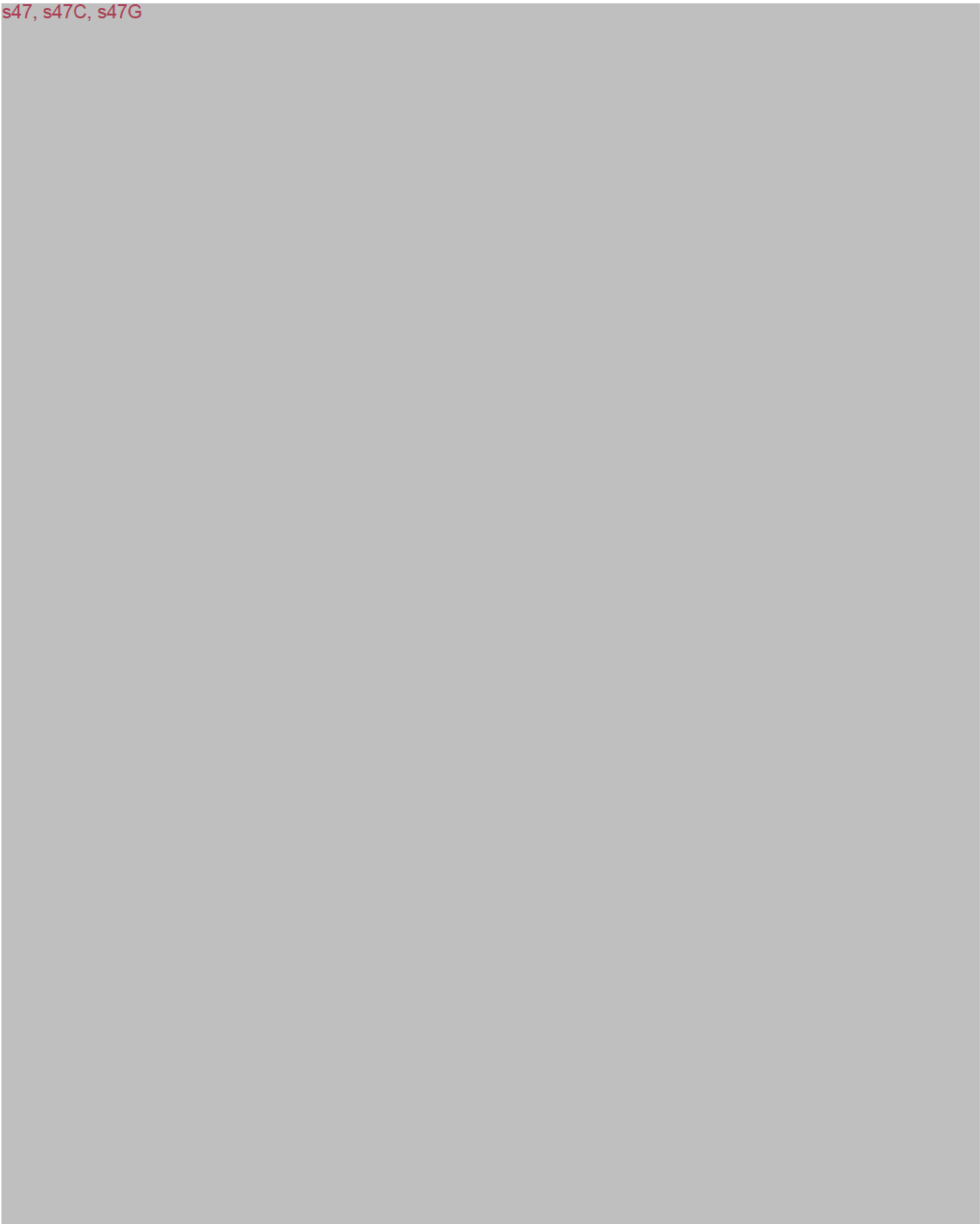


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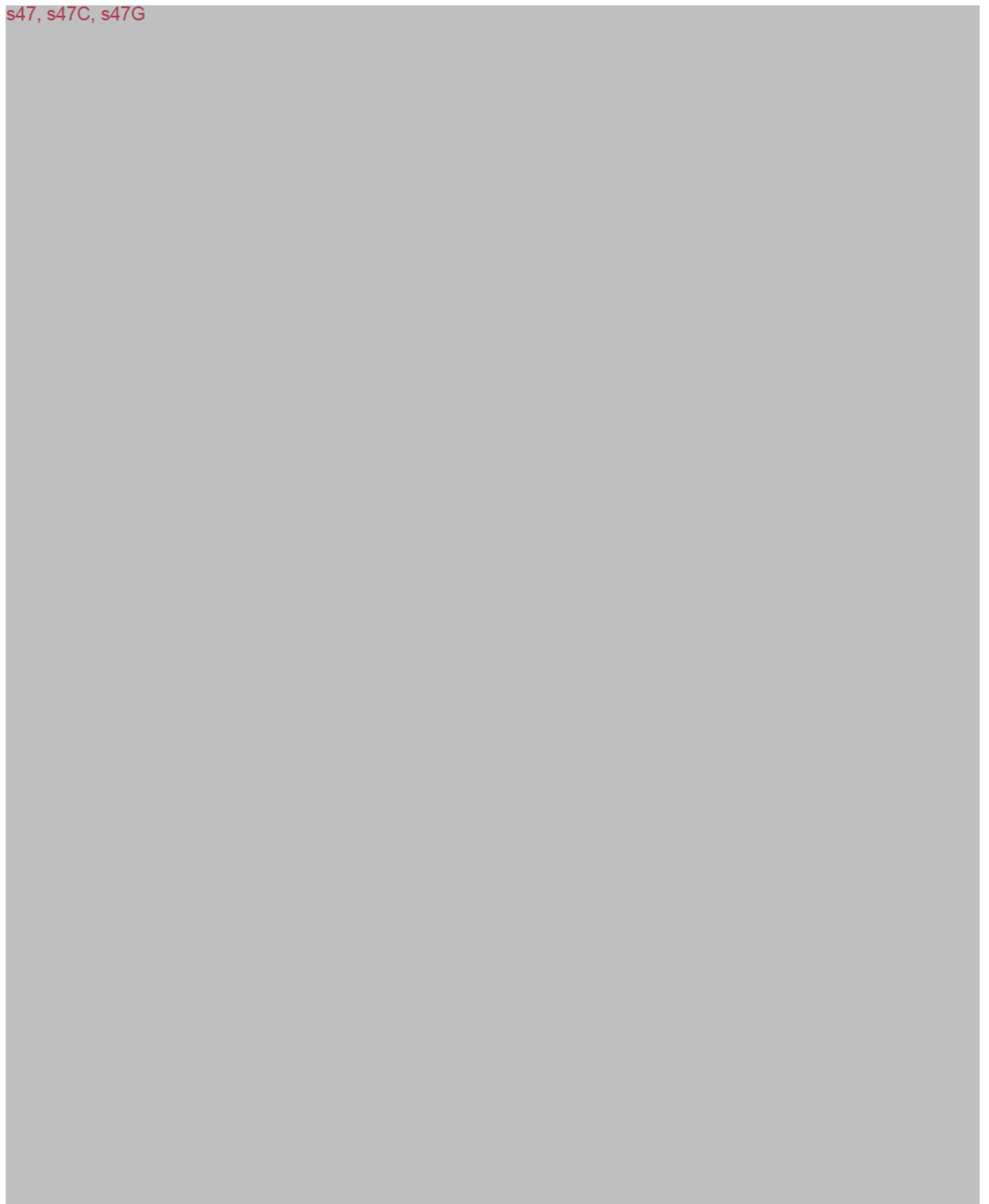


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## A Acronyms

### A

ABL	Allocated Baseline
ABN	Australian Business Number
ACS	Attack Class Submarine
ADA	Australian Design Authority
AICP	Australian Industry Capability Plan
AICS	Australian Industry Capability Strategy
ALBTF	Adelaide Land Based Test Facility
ASC	Australian Shipbuilding Company
ASCRP	Australian Subsidiary Capability Realisation Plan
AU	Arrangement Unit

### B

BMS	Business Management System
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### C

CCP	Contract Change Proposal
CDR	Contractual Data Requirement
CDRL	Contract Data Requirements List
CIDP	Contractor IPDSE Development Plan
CM	Configuration Management
CMR	Critical Manufacturing Review
CoA	Commonwealth of Australia
COC	Conditions of Contract
COS	Construction Order Specification
CS	Combat System
CSI	Combat System Integrator
CSPI	Combat System Physical Integration

### D

DA	Design Authority
DAFS	Design Authority for Sustainment (non-arrangement engineers from France)
DDA	Detailed Design Authority
DID	Data Item Description
DMC	Design Mobilisation Contract

DMU	Digital Mock Up
DP	Design Process
DSJF	Design Selection Justification File
DTP	Detailed Training Plan

### E

ED	Effective Date
EMP	Engineering Management Plan

### F

FoC	First of Class
FSM	Future Submarine
FSP	Future Submarine Program

### H

HR	Human Resources
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### I

ICD	Interface Control Document
ICT	Information and Communication Technology
IDD	Interface Definition Document
IMS	Integrated Master Schedule
IP	Intellectual Property
IPDSE	Integrated Product Development and Support Environment
ITAR	International Traffic In Arms Regulations

### L

LMA	Lockheed Martin Australia
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### M

MBL	Manufacturing Baseline
MSODD	Mission System Operational Description Document
MTP	Master Training Plan

### O

ODPP	Output Data Production Plan
OJT	On the Job Training

**P**

PBL	Product Baseline
PCE	Program Cost Estimate
PLBTF	Platform Land Based Test Facility
PLM	Product Lifecycle Management
PMP	Project Management Plan
PR	Program Review
PSSP	Program Staff/ Skills Profile

**R**

RMP	Risk Management Plan
ROM	Rough Order of Magnitude
RTO	Registered Training Organisation

**S**

SDC	Submarine Design Contract
SEMP	Systems Engineering Management Plan
SOW	Statement Of Work
SPA	Strategic Partnering Agreement

SSDD System/Subsystem Design Description

STW Setting To Work

**T**

T&E	Test and Evaluation
TAFE	Technical and Further Education
TCA	Tripartite Co-operative Agreement
TNA	Training Needs Analysis
ToT	Transfer of Technology
ToTP	ToT Plan
ToTS	Transfer of Technology Strategy
TWFOR	ToT Way Forward Options Report

**V**

V&VP	Verification and Validation Plan
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**W**

WFR	Way Forward Review
WW	Whole Warship



## B DID Requirements Traceability Matrix

DID Para	DID Para Title or Description	Cross Reference
	Detailed Design DP4 Phase	
	the objectives of the phase, including the required inputs and the associated outcomes to be achieved	5.1 to 5.4
	a brief description of any sub-phases and the major activities conducted during those sub-phases	5.5
	a detailed schedule for the phase and each sub-phase, using the current IMS as the baseline, but including at least two more levels of detail than shown in the current IMS (except where otherwise agreed by the Commonwealth) and identifying any key linkages with other elements of the FSP (eg, in relation to the implementation of the Contractor-provided ICT and Contractor IPDSE)	5.6
	a summary of the workforce required to conduct both the Detailed Design DP4 Phase and the baseline ToT Program, as derived from the Approved ToT Baseline Data Items (to the extent applicable), including	
	<ul style="list-style-type: none"> <li>estimated numbers of personnel required across the phase and each sub-phase, using the same breakdown for the labour categories and skill levels used in the PSSP</li> </ul>	Annexes D-G
	<ul style="list-style-type: none"> <li>proposed organisational structure, including a summary of the position descriptions for each of the management positions; and</li> </ul>	5.8
	<ul style="list-style-type: none"> <li>justification for the proposed organisation and personnel numbers, citing similar industry workforces and studies (eg, any comparison with RAND studies or with workforces within the Australian Submarine Corporation (ASC));</li> </ul>	5.8
	a summary of the ICT and other significant resources required to carry out the work, including the identification of any elements that may be only available in one location and/or could be a constraint on the design process due to limited availability; and	5.9
	a Rough Order of Magnitude (ROM) price for the baseline program for the phase, as identified in the current IMS and costed in the current PCE	9.2
	ToT Strategy Options	
	The TWFOR shall describe the ToT strategy options in relation to any detailed design work that is not currently programmed to be conducted in Australia (as set out in the Approved ToT Baseline Data Items), including in relation to	
	<ul style="list-style-type: none"> <li>the alternative locations and associated timings for conducting the detailed design work for the Whole Warship (e.g, as between France or Australia, or partly in both locations), including the rationale for selecting each of the alternatives; and</li> </ul>	6.4 to 6.7
	<ul style="list-style-type: none"> <li>a description of the essential characteristics of each of the alternatives</li> </ul>	6.4 to 6.7
	The TWFOR shall describe each of the ToT Capability options considered in relation to implementing the Capability to Carry Out Detailed Design and the Design Authority for Sustainment, particularly in relation to the provision of Training (including OJT), including	
	<ul style="list-style-type: none"> <li>an overview of the engagement with Australian industry to determine the current capabilities available in Australia to support the conduct of detailed design work and/or the implementation of the ToT Capabilities, including (for example) in relation to Training: <ul style="list-style-type: none"> <li>working with ASC and BAE Systems for OJT; and</li> <li>utilising Technical and Further Education (TAFE) S.A. to deliver Training</li> </ul> </li> </ul>	5.8.8
	<ul style="list-style-type: none"> <li>the methodology used to identify the implementation options considered</li> </ul>	6.1



DID Para	DID Para Title or Description	Cross Reference
	<p>a description of each of the implementation options, including:</p> <ul style="list-style-type: none"> <li>▪ the location(s) to which the option is applicable;</li> <li>▪ an overview of the essential characteristics, including in relation to: <ul style="list-style-type: none"> <li>◦ the impact on the FSP schedule set out in the latest version of the IMS; and</li> <li>◦ the number of labour hours of effort and the costs in both Australia and France;</li> </ul> </li> <li>▪ the implications for the option in relation to both Sovereignty and Australian industry content, including an estimate of the Australian content in both hours and costs;</li> <li>▪ the implications of the option for other elements of the FSP, including in relation to Contractor-provided ICT and the Contractor IPDSE;</li> <li>▪ the implications of the option for Export Approvals or related considerations;</li> <li>▪ the implications of the option in relation to the workforce requirements in both Australia and France, including: <ul style="list-style-type: none"> <li>◦ the workforce required – by location over time and, for the Australian workforce, identifies the split between the Australian Subsidiary and other Australian suppliers;</li> <li>◦ a description of the Training to be done – by location and by course / OJT; and</li> <li>◦ a description of the work to be done by the trained personnel after OJT; and</li> </ul> </li> <li>▪ the benefits, costs (including opportunity costs) and risks associated with the option, which in relation to: <ul style="list-style-type: none"> <li>◦ cost, shall be identified against the baseline ROM cost identified in response to clause 11 above; and</li> <li>◦ risks, shall be analysed in accordance with the Approved RMP, including the identification of any proposed risk treatments and the pre- and post-treatment impacts.</li> </ul> </li> </ul>	6.4 to 6.7
	<b>Summary and Recommendations</b>	
	The TWFOR shall provide a summary of the findings in tabular format to facilitate ease of comparison	7.
	The TWFOR shall identify the Contractor's recommended ToT strategy options, and shall provide justification for the recommendations	8.
	The TWFOR shall include a roadmap for the delivery of the ToT Capability Plan(s) to be documented in an update to the ToTP in accordance with the SDC SOW	5.8.9 9.3



## c **Design Activities other than DP4 of the FSM (FGD - ~~FOUO~~)**

DP4 design activities are not the only design activities performed in Australia, other design activities have already started or will start progressively:

- Qualification of Common Technologies;
- system engineering (analysis of the Mission System Operational Description Document (MSODD));
- participation of the development of the Ship Management System (SMS); and
- Detail design (DP4) of the PLBTF;
- Support to the Hull Qualification Section;
- Prototype Combat System raft; and
- This section presents an overview of these activities and their connections with the Submarine DP4 phase.

These activities do not depend on the choice of the option to transfer detailed design to Australia; they will start at the same date s47, s47C, s47G

Some of these activities provide support to the transfer of capability to Naval Group Australia.

### c.1 **Design activities starting during the Design Contract**

The qualification of common technologies, systems engineering and development of the SMS are described in the DC offer and SoW.

#### c.1.1 **Development of the Ship Management System**

Naval Group Australia is responsible for some activities for the development of the Ship Management System (SMS) in Australia.

For this activity, Naval group proposed that the work is split between the French team and the Australian one, France remaining the Design Authority. This organisation provides the transfer of the knowledge to Naval Group Australia, needed to become the Sustainment Design Authority of the FSM.

The work starts in CWS1 and will continue during CWS2 and the detailed design phase.

#### c.1.2 **PLBTF**

The main ToT activity for the PLBTF is planned to occur in 2021, with the commencement of the Detail Design (DP4) activities in Australia. The current agreed strategy is to employ the services of a third party contractor to carry out the test bench detail design, procurement and installation using an Engineering, Procurement and Construction (EPC) contractor. The building is planned to be available at the end of 2021 and the test bench installation will commence in mid-2022.

In order to ensure this transition to Australia, work to source the EPC contractor commenced in the FS phase. This will continue via the standard approved procurement process (RFI, RFP, RFQ) until late 2020, when the contract will be awarded.



In parallel, NGA will hire a team of five engineers in 2020. It's intended that these people will have combined skill sets in submarine propulsion and electrical engineering, testing & commissioning of electrical installations and project management. This group will be required to spend time in the Naval Group Indret facility, France for the latter half of the DP3 phase of the project and will return to Australia to manage the EPC subcontractor for the remainder of the PLBTF build program, they will then transition into the role of managing the test activities within the PLBTF. It is expected that the entire workforce for the design and build of the PLBTF will be established by the EPC subcontractor and that there is no opportunity to train detailed design arrangement designers on this task as the task is considered a normal industrial activity with no relation to the arrangement of a submarine.

The ICT arrangements related to the PLBTF are currently being developed. At the conclusion of DP3, a Technical Data Package (TDP) will be transferred to NGA with the work undertaken to that point and everything the EPC Contractor needs to commence DP4. The details of the TDP are not fully developed at this time and will depend somewhat on the chosen contracting partner. In terms of technical and data management during DP4, there are many scenarios that can be envisaged, but the final scenario will be dependent on the agreed levels of Design Authority between NG SA and NGA.

Additionally, NGA Technologists are currently providing (and will continue to provide) technical support to the Procurement Team for the sourcing of the critical and main equipment items required for the PLBTF.

Finally, the NGA Engineering Team are providing technical support to the SCY Team for the PLBTF infrastructure activities, when requested.

Overall, the ToT strategy for the PLBTF will see Australian engineers gain hands-on experience in France in the Test Bench design, by being embedded in the Design Team. They will extend and expand this experience and the knowledge transfer throughout the period of the EPC contract in Australia. The knowledge gained by the Australian Technologist Team through the equipment procurement process will be used to supplement the PLBTF Team during this time to ensure the design, installation and commissioning activities in Australia are successful.

It is expected that support from NG SA will be available throughout the PLBTF development phase, including when the integration testing activities are conducted. This will be the form of "back-office" support, including the presence of NG SA experts in Australia at strategic times and an NG SA presence for extended periods if required.

The skills required for the PLBTF comprises:

- a Chief Operating Officer;
- Test leaders;
- Mechanical engineers;
- Electrical engineers;
- Mechanical system manager;
- DGR specialist;
- General Maintenance Specialist;
- General Technicians;
- Electrical & Propulsion manager;
- MEM specialists;
- MSB specialists; and
- Electrical specialists.





It is assumed that there will be about 25 people from the engineering team in the PLBTF. There will be also some support functions and some resources from the production team (about 8 to 10 people).

When the precise agenda and workload of the PLBTF will be known, it will be possible to optimise this team with the rest of the engineering department.

### C.1.3 Hull Qualification Section

The Hull Qualification section has initially the following objectives:

- qualify the Australian shipyard to the efficient implementation of the Naval Group building procedures; and
- verify that the Submarine Construction Yard as Build System fits for purpose. This includes testing and checking the complete process from Design data to Production and from Production to Conformity building.

The Hull Qualification section aims at qualifying the Australian Shipyard in the following fields:

- hull and structure field trade (fabricated structure, grinding, oxygen cutting, machining, forming, welding, pre-heating, production inspection, etc.);
- piping field trade (manufacturing, positioning, mounting and welding);
- mechanical field trade (mounting, machining);
- electrical field trade (cable routing, termination and testing); and
- quality Control, Dimensional Control and NDT Inspections.

The objective of this Hull section, beyond the fields above, is to carry out all the Naval Group processes in a nominal way, relying on all the IT tools, industrial means and the Shipyard Organisation which will be implemented for the Design, the Production engineering and the Construction of the 1st FSM.

Therefore, the Hull qualification section is an opportunity to support after a first set of theoretical training sessions and OJT on the following DP4 sub-processes:

- DP4.1 Carrying out the detailed design of solution;
- DP4.2 Conducting the detailed arrangement studies;
- DP4.3 Performing detailed production engineering for solution;
- DP4.4 Defining the general procedures for integration, verification and validation of the solution; and
- DP4.6 Performing detailed production engineering for production in progress.

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## C.1.4 Prototype Combat System Rafts

### C.1.4.1 Opportunity

The design of the prototype combat system rafts will provide the first opportunity to perform detailed design activities in Australia, even if this will be on a limited scope. According to the present design of the FSM, the scope of work will cover the three combat system rafts.

It is foreseen that a team of about 15 people will start the detailed design of these rafts in Australia in early 2024. This team will be composed of arrangement designers and some structural engineers.

### C.1.4.2 References

The following documents define a first workshare between LMA and Naval Group:

- Naval Group Combat System Physical Integration (CSPI) Plan;
- LMA:
  - CSPI Plan;
  - CSI strategy; and
  - V&V strategy.

During the Detailed Design (DP4) Phase, the Technical Data exchanged between Naval Group and LMA will deal with four main topics:

- documents required to perform Installation on rafts and platform, Setting To Work (STW) and pre-delivery maintenance of equipment;
- interface data required to conduct Test and Evaluation (T&E)/Verification and Validation (V&V);
- data to elaborate Sustainment products before FSM delivery to CoA; and
- information related to the management (as example, schedule) of the current and following phases.





### C.1.4.3 Objective of the Prototype Combat System raft

The objective of the prototype Combat System (CS) raft is to:

- Provide rafts to LMA to qualify the Combat System and train their personnel before the availability of the rafts for the FoC; and
- Test and qualify the workshare and the methods that will be used for the detailed design, production and test of the first boat.

This means that we will have to qualify the exchange of data needed during the:

- detailed design phase;
- build phase; and
- setting to work and test and trial phases.



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